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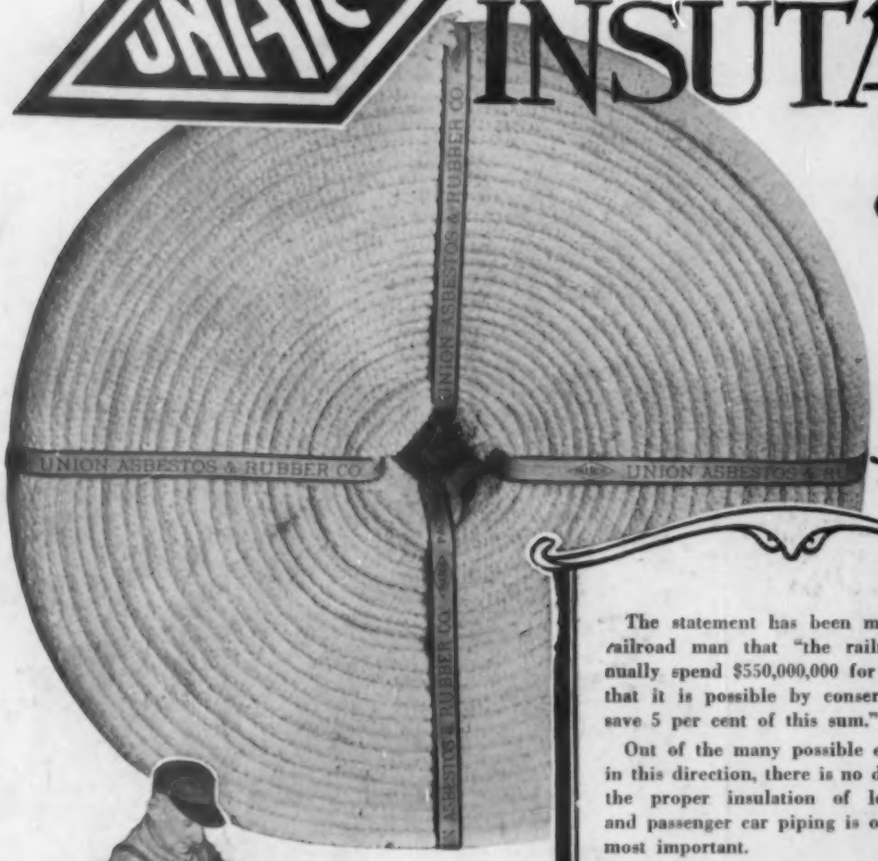

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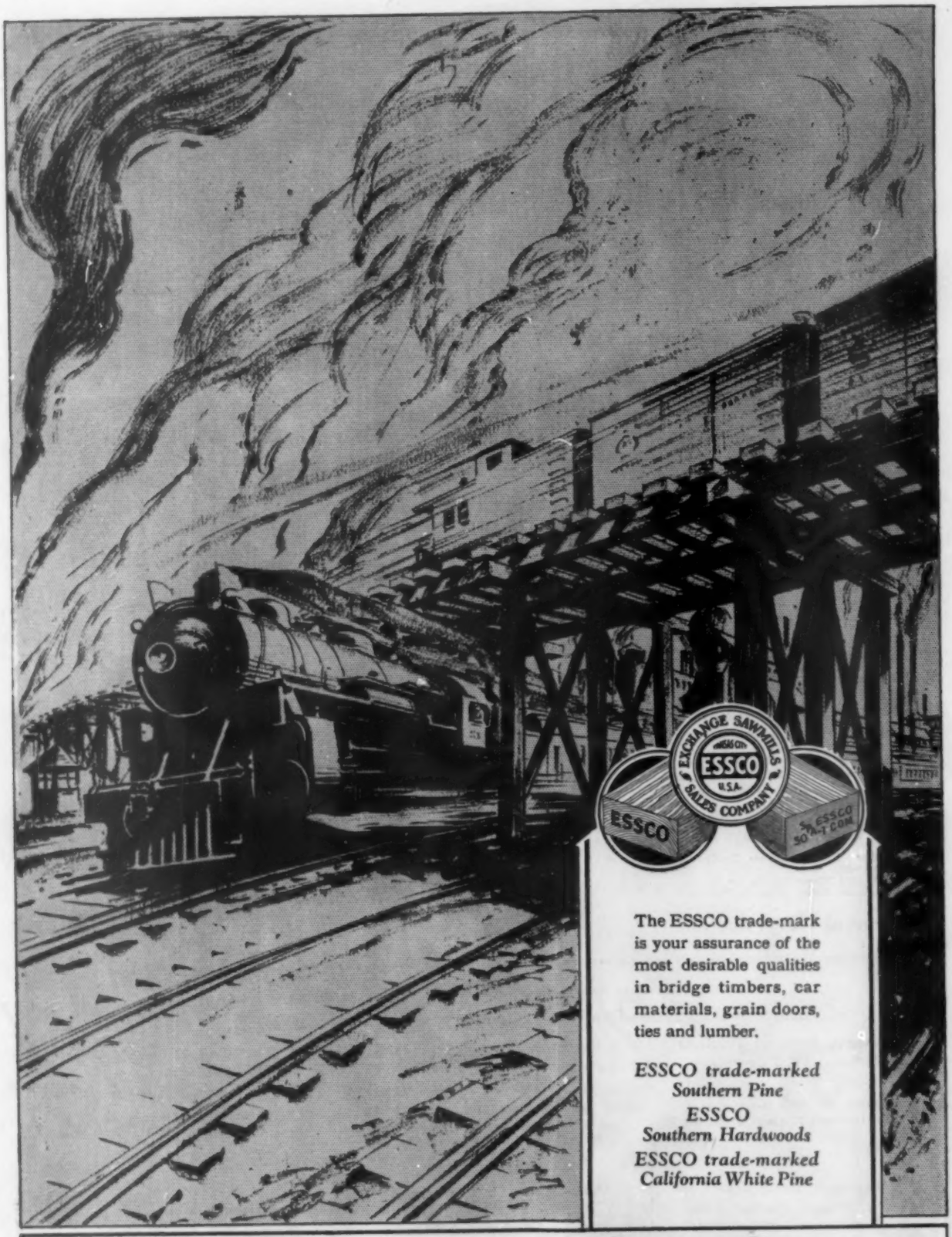

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Railway Age

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1926—A Year of Great Railway Progress and Achievement

By The Editor

An Advance All Along the Line

THE progress made in 1926 in improving the railway situation should be surveyed with great satisfaction by everybody, and especially by railway officers and employees. It was a striking vindication of the better regulation and the policies of management that have prevailed within recent years. Dr. Julius H. Parmelee, the able director of the Bureau of Railway Economics, gives elsewhere in this issue, in his usual interesting, lucid and thorough way, a statistical review of the year.

While passenger business again declined slightly, freight business surpassed all records, making the largest increase since 1917. In spite of the loss of passenger business and the continued slow decline of rates, total earnings were the largest in history. Freight service was the best ever rendered. Operation set a new high record of efficiency and economy. Net operating income was the largest in amount for any year, and in percentage of return upon investment approached the figures of good pre-war years. Many increases in dividends were made. Prices of securities advanced to new high post-war figures, and many common stocks became marketable. The financial results of the western lines as a whole still lagged behind those of the railways of other territories of the country, but improved considerably.

What of 1927?

THERE is not much difference of opinion among railway executives regarding the business prospects of the new year. This is indicated by the articles under their signatures published elsewhere in this issue. A few fear some decline of traffic. Most of them expect business to be as good as in 1926; some expect it to be better. General economic and financial conditions seem to be almost unprecedentedly sound. The supply of capital seeking investment is so large that some authorities forecast an early decline of interest rates. This condition must be stimulating to industrial development and commercial activity. But at the turn of the year few or no authorities seem to forecast better general business in the country as a whole in 1927 than in 1926. Railway freight business comes from everywhere, and depends on the condition of general business in all industries.

Vast shipments of coal have been made recently, and probably will be continued until April 1 in anticipation of a strike in the union coal mines. Export coal business will decline; if a strike occurs it will seriously reduce coal traffic on railways serving union mines. Probably it will not hurt business as much as the strike of 1922 because a much larger part of the coal is now produced in non-union mines. The cotton situation in the south is unsatisfactory, but railway executives in that territory believe it is being sanely and effectively dealt with, and seem not to fear its results. The traffic of the western lines is the best evidence that conditions in that territory, including that of agriculture, are slowly but steadily improving.

Will Net Return Increase?

ONE of the most important railway events of last year was the award of an advance in wages to conductors and trainmen of the eastern railways. This and other advances that have been made will not only cost a good deal, but will stimulate demands for still other advances. Taxes increased ten per cent, and it seems futile to hope their increase will stop until the American people awaken to a realization of the immense burden they are putting on themselves by constantly adding to everybody's taxes, including those of the railways.

It appears that if the total earnings are not larger than those for last year, most roads may have a hard time equaling the net return of last year. The record of recent years shows, however, that increased efficiency of operation can produce remarkable effects on net returns without much of an increase in total gross earnings.

A Three-Years' Record

FEW people realize what an achievement it was for the railways to render the kind of service they did in 1926, and earn the net operating income they did. The magnitude of the accomplishment may be best indicated by a brief review of the last three years. Freight business and total earnings in 1923 were the largest up to that time. Freight earnings of Class I roads would have been $230,000,000 larger last year than in 1923 if the average revenue per ton-mile had been the same. But it was not. Reductions in average revenue per ton per mile since 1923 cost the roads about $90,000,000 in earnings in 1926. Both passenger business and the average passenger rate declined, resulting in passenger earnings being about $100,000,000 less than in 1923.

In consequence, there was an increase over 1923 in total railway earnings of only about $40,000,000. This was more than consumed by the increase of about $60,000,000 in taxes. The three years' increase in the average wage paid employees would have been sufficient, if there had not been a reduction in the number of employees, to have added almost $50,000,000 to the payroll.

But in spite of all these adverse influences, such great economies in operation were effected that the net operating income earned in 1926 was about $250,000,000 more than in 1923.

Brains, Co-operation and Capital

A GREAT artist, famous for the colors in his pictures, being asked about the mixing of his paints, replied that he mixed brains with them. Brains are still the main element mixed with other elements in business management if the results make a good picture. Long, hard experience convinced thoughtful railway officers that less competition and more co-operation between railways was essential to the most efficient utilization of the facilities of all, and that without this good service and satisfactory financial results could not be obtained. The brains of the railway and shipping worlds saw that, in the interests of both, more co-operation between those who furnish and those who use transportation service was essential. Employees who use their brains became convinced, especially after the shop strike of 1922, that employees had nothing to gain and much to lose by working against their officers instead of with them.

To unprecedented co-operation between all these classes is largely due the improvement in every feature of the railway situation that has occurred. The Interstate Commerce Commission also has been most helpful within the last three years by resisting demands for unwarranted reductions of rates, and giving cordial support to co-operation between the railways, and between them and the shippers. The investment of a vast amount of capital was, however, indispensable to achieving the progress that has been made. It will be even more indispensable to further similar progress.

Good Work by Operating Officers

EXPERIENCE has shown there was formerly slack in railway operation that could be taken up by better utilization of available facilities. The co-operation mentioned, and numerous improvements in operating methods, have taken up a great deal of it. Operating officers all along the line—vice-presidents, general managers, general superintendents, superintendents, trainmasters, road foremen of engines, yardmasters—have worked wonders in increasing utilization of equipment. The efficiency with which it is used can still be increased. Shippers can load cars more heavily, and load and unload them more promptly. The movement of cars while in the hands of the railways can still be intensively studied by operating officers with the result of finding ways of keeping more of them out of yards, and getting them out of and into terminals, through yards and over the road faster. The lengthening of runs to get more mileage out of locomotives still has large possibilities on many lines.

But the slack that already has been taken up cannot be taken up again. If traffic continues to grow—and nobody doubts it will—probably a relatively greater increase in invested capital will be needed in future for handling it than has been needed within recent years. That is not the only, or perhaps the main, thing for which it will be needed. It will be imperatively needed to keep down or reduce operating expenses.

Capital versus Operating Costs

THE average wage paid per employee last year was greater than in 1923. The total payroll was less. Of course the explanation is to be found in the fact that the number of employees was reduced. The reduction in number of employees saved more than enough to pay both the increase in the average wage and the increase in taxes above referred to. This reduction of employees could not have been made without the improvements in locomotives, cars, shops, shop equipment, tracks, terminals, signaling and so on that have been effected by the investment of new capital. Fuel consumption has been reduced. Much of this has been due to better locomotives and locomotives in better condition. Loss and damage of freight have been reduced. Much of this has been due to cars in better condition, many of them new. Co-operation, intensive study of operating methods, better supervision, improved morale of employees—all have helped. But the main thing that has brought down operating costs has been the investment of billions in improvements.

Capital has to be paid for, but increased capital costs are in the long run the only thing potent enough to knock out increased unit costs of operation.

Giving Capital a Chance

THOSE who long have followed railway development can recall having read and heard on sundry occasions in the past the statement that means previously used for effecting economies—especially increasing of train loads—were being exhausted. Nevertheless, the increase of train loads has gone right on, and continues up to the present time to be the principal means of effecting economies. And a new factor of great importance has been introduced. This is the modern steam locomotive, which is so designed and equipped that it will not only pull a heavier train load, but pull it faster, with a reduced consumption of fuel in proportion to the ton-miles of service rendered.

To use the modern locomotive with maximum efficiency it is necessary to improve almost every other part of the railroad physical plant that is used directly or indirectly in handling trains and maintaining equipment. The modern locomotive makes thousands of old locomotives obsolete. The increasing length of trains makes thousands of old, weak freight cars obsolete. The necessity for keeping larger and more expensive equipment moving renders a large part of shop tools obsolete. Every advance in wages increases the necessity of saving labor, and renders obsolete almost every tool or piece of machinery that can be replaced with one that can be operated with less labor.

In the final analysis, it is usually found that the only solution of the problem of keeping all parts of a railway plant equally efficient, and of effecting substantial economies, is to give new capital a chance.

Contribution of Mechanical Department

THE provision of power to haul more gross ton-miles per hour at a reduced fuel rate has been perhaps the largest single factor in the operation showing that has been made. While a number of roads installed the best of modern power in considerable amounts during 1926, there is still much to be done in replacing obsolete locomotives, since a large proportion of those now in service have less than 50 per cent of the capacity of the new power, when measured in gross ton-miles per hour, and consume twice the fuel per unit of work.

In general, a better relation between railroad managements and their mechanical department employees has been brought about since the shop strike of 1922, and the resulting improvement in morale has been reflected in better workmanship, higher standards of maintenance and reduced cost of repair work. Many railroads now point with pride to greatly improved engine failure and hot box records, both of which have a very direct bearing on the cost of operation.

Another real mechanical accomplishment has been the progress in air brake test work at Purdue University which, as conducted under the direction of the American Railway Association, has been handled on such a strictly fair and impartial basis as to win the confidence and approval of all the independent manufacturers concerned as well as of representatives of the Interstate Commerce Commission. This work, together with that of testing draft gears, which will probably be initiated next year, holds much of promise for the betterment of these two vital parts of the railroad machine.

A Big Year for Roadway

THE year 1926 was the most active in point of construction since the war, the mileage of new lines completed being 35 per cent greater than in 1925 and exceeding 1,000 for the first time since 1916. The confidence with which the managements are facing the future is indicated by the fact that an equally large construction of new mileage is in prospect for 1927. The excess of mileage built over that abandoned last year probably has not been equalled for more than a decade.

No small part of last year's improvement in operation was due to the fact that more money was spent during the last two years for those roadway facilities which expedite the movement of traffic and increase the service secured from equipment than in any previous years. The increased use of heavy rail was particularly marked, rail of 110-lb. section and heavier being laid on a number of roads for the first time. Ballasting and other work having for their object the strengthening of track were carried on with equal liberality. The reconstruction of bridges to permit the operation of heavier locomotives was particularly pronounced, as was the reconstruction of classification yards and of other facilities tending to facilitate the movement of more and heavier trains. As a whole, the permanent structures of the railways are now in the best condition that they have been for years, if not in their history.

Saving Operating Costs with Signals

A GOOD illustration of the effective use of capital to enlarge capacity and increase efficiency and economy of operation is afforded by the increase in the installation of block signaling. The block system was originally introduced and developed almost entirely to promote safety by preventing collisions. Within recent years there has been growing recognition of the fact that by helping to keep trains moving it increases the capacity of a line and makes it possible for locomotives to produce more ton-miles of transportation per hour. As evidence of the increasing appreciation of the purely economic value of signaling it is significant that 5,000 miles of signaling was installed in 1926, an increase of 13 per cent over the installation made in any previous year. Automatic signals permit closer spacing of trains, thus increasing the capacity of existing tracks at a minimum capital cost in many cases.

A new method used in a recent installation is to locate the signals so as to space trains on a time basis rather

than on distance. With increased train loads, the elimination of unnecessary train stops becomes more important. By means of remote control switch machines, automatic interlocking, spring switches and combination of the control of two or more interlockings into one tower, the advantages of interlockings to eliminate train stops are being secured without increasing the operating costs for the wages of levermen.

Better protection for 24 hours a day is being secured in many locations on at least ten roads where highway crossing gates have been replaced by automatic wig-wag or flashing lights. Explanations of the savings made possible by these facilities are given in an article elsewhere in this issue. On one road savings in operating expenses totaling $180,000 last year were accomplished by the use of spring switches, changes in interlocking, and highway crossing protection made within the last three years.

Policy of Courage Indicated

THE developments of recent years, and existing conditions, indicate that a policy of boldness in investing capital in improvements will be justified by results. The article by railway executives published elsewhere in this issue foreshadow capital expenditures in 1927 on about the same scale as in 1926. They imply that if traffic continues heavy such expenditures may be increased, while if it shows any decline they may be somewhat reduced. Almost without exception the railways in any particular territory that are now earning the best net returns are those the managements of which have, over a period of years, displayed courage in investing capital to enlarge capacity and effect economies.

Some years ago the president of an important system was testifying before the Interstate Commerce Commission in a rate case when he was asked how long it would be necessary to make such large investments in his railroad. He replied: "As long as it continues to be necessary to handle more traffic and effect economies. A railway is like a case of typhoid fever—it is always either getting better or worse." A railway that does not expand its facilities while others in its territory are doing so usually soon finds that business it should be getting is going to its competitors because they can handle it better.

As to economies, they are effected mainly by those improvements in plants or methods which make it possible to get a greater output of transportation with a given number of man-hours of labor and of tons of fuel and materials. No organization can long increase the amount of traffic handled or the efficiency with which it is handled without the constant application of new capital. It has been well said that nothing is more expensive than wearing out obsolete locomotives. The same thing is true of any obsolete part of a railroad plant; and the only cure for obsolescence is new capital.

Increase of Dividends

MUCH too great a part of the capital invested in railways within recent years has been raised by increasing their indebtedness. Most of them, if they were to raise it at all, had to raise it in this way. Their net income was not sufficient to pay dividends which would enable them to sell stock. The returns on stock received by different railroads vary so widely, and so many of them have "outside income" not derived from their earnings, that any figure that is given regarding the return on stock is likely to be misleading.

The only figure that can be used roughly to indicate the railway situation as a whole is that of ratio of net income to all stock. In 1916 this reached the comparatively high figure of 8.2 per cent. For some years before, however, railway results had been unsatisfactory. The dividends paid declined after 1911, and the temporary increase of net income in 1916 caused only a small and temporary increase in dividends. Net income upon stock increased from the low average of 3.94 per cent in 1921 to 8.2 per cent in 1925. "The dividends declared by all operating roads except switching and terminal companies, including those paid in some cases by one corporation to another," said the Interstate Commerce Commission, in its recent annual report, "amounted to $349,000,000 in 1925. This was less than the average amount of dividends declared in the five year period ending June 30, 1914." The average net income on stock further increased in 1926. As a result of the increases in it within recent years, some roads have increased dividends already being paid, and others have begun paying dividends. The record of changes in dividends within the last year is given elsewhere in this issue.

The prices of railway stocks are now higher than for some years, and several railways have begun to raise capital by selling stock. The time has not yet come when a railway paying dividends of less than 7 per cent, and holding out no prospect of an early advance in the dividend rate, can finance by the sale of stock. Furthermore, no railway would be justified in paying out in years of prosperity anywhere near all of its net income in dividends. If, therefore, a large part of future financing is to be done by the issuance of stock, it is evident that the average return earned on stock must be increased and subsequently maintained. The desirability of financing with stock is emphasized by railway executives in the articles by them published eysewhere in this issue.

Public Attitude Toward Railways

THE public's attitude toward the earning of substantial rates of return on stock and the payment of substantial dividends was hostile so long that every railway executive was a victim of conflicting emotions when reports of large earnings by his company were published. He was glad to have the reports go to in-

vestors. He dreaded the effect of having them go to the public. The time has not passed when such reports cause adverse comment from self-constituted spokesmen of the public. But there has not been a year in a quarter of a century when they called forth as little unfavorable comment as in 1926.

Press, public and regulating authorities apparently are coming to a realization that prosperous railways are an asset, not a liability, to the country; that in the long run railway prosperity is essential to good transportation service; and that such service is well worth the price in reasonable dividends to railway stockholders that must be paid for it. Last year was notable for the small number of misrepresentations put in circulation regarding the railways, and for the many things that were said by the press and spokesmen of business interests in praise of their management and service and regarding the necessity of letting them make reasonable earnings and pay dividends in order that they may raise the capital required to maintain good service.

Dealing with Public Sentiment

MOST railway officers seem to continue, however, to be alive to the necessity of not only giving good service, but of keeping the public informed regarding what the railways are trying to do and actually are doing. The existing situation is to a large extent due to educational work that has been carried on among the employees and the public. The reasons why such work cannot be safely discontinued or even diminished have been rather strikingly stated in part by a man who has said: "Your public is a different public every day. In every group of one thousand people in the United States, 11 die every day and 22 are born. There is no such thing in public relations as staying where you are. Every day 11 out of every thousand—full of your good will propaganda—depart into a country where there is no space nor time and hence no railroads; and 22 people—full of nothing but ignorance and appetite—rise up to demand who you are and by what rights you are entitled to your business and your profits."

Perhaps it might more accurately be said that many of those whose minds formerly were filled with misinformation and prejudice are disappearing from the scene, while new generations are taking their place whose opinions will more and more constitute public sentiment in future. Their minds are more open, and they want to know the truth about the railroads. It has been so hard for many years to get fair and constructive regulation because so many of those whose opinions constituted public sentiment had their opinions formed by railway abuses and anti-railway propaganda years ago. Everything that is done now to create sentiment favorable to the railways will be a protection to them in future, for the same reasons that the abuses and anti-railway propaganda of past years have been a menace to them so long.

A Test of Public Sentiment

THE present session of Congress will afford early in the new year an interesting test of public sentiment. The members of Congress do not always represent the sentiment of their constituencies. If they did, more of them would get re-elected. There can be no doubt, however, that they try to represent it and that they usually do. Sound regulation must be based on economic principles applied by some such body as the Interstate Commerce Commission, rather than on political principles given effect by Congress. There are a number of bills pending, such as that to abolish the surcharge on sleeping and parlor car tickets, the Gooding long-and-short-haul bill, and the bill for regional appointment of interstate commerce commissioners which, if passed, would obviously involve the application of political principles to regulation and establish precedents of a very dangerous kind.

The trouble in the case of such measures usually is that they are energetically supported with political pressure by people of selfishly interested classes or territories, while they are not understood or their significance appreciated by the public in general. If opposition to them is to be successful the desired result must be accomplished, first, by definitely informing as many people as practicable regarding their true nature and tendency, and, secondly, by creating a general sentiment in favor of a sound, constructive policy of regulation which public men can rely upon to support them in opposing measures that can easily be shown to be contrary to such policy. A great deal of work has been done on behalf of the railways to accomplish these purposes. It will be interesting to observe the effects produced by this work on proposed railway legislation at this session.

Regarding Consolidations

THE only other important railway measure that probably will be considered during this session is the Parker bill to amend the provisions of the Transportation Act regarding consolidations. The progress toward consolidations that has been made during the last year is reviewed elsewhere in this issue. The Interstate Commerce Commission showed in its recent annual report that since 1920 it has authorized acquisition by some railways of others having approximately 31,000 miles of line. This includes 6,328 miles covered by applications granted last year up to October 31. The Parker bill would authorize voluntary consolidations subject to the approval of the Interstate Commerce Commission.

The death of Senator Cummins of Iowa removed from public life the chief protagonist of the theory that consolidations on a large scale would effect great savings and that they should be made compulsory by legislation.

There is not in evidence any strong or wide-

spread public sentiment in favor of consolidations. The public, public men and railway officers seem to take about the same view of the matter—viz., that many consolidations are desirable, but that care should be taken to avoid making railway systems too large, and that those consolidations that are desirable can be best worked out by voluntary negotiations between the railways, with the Interstate Commerce Commission having in each case the final decision in order to protect the public interest.

No doubt if the Parker bill is passed many consolidation plans already formulated will be pressed and others will be formulated. In view, however, of the difficulties those representing different railways will have in reaching agreements, and the difficulties that, after they have agreed, they are likely to encounter in getting the commission to agree with them, consolidation promises to be a comparatively slow process.

A Great Program Vindicated

THE railways in entering 1927 have left behind them within recent years a splendid record of achievement. As one looks back upon the program of capital expenditures, improved operation and better service that their executives concertedly adopted and publicly announced in 1923, the perspective gives it an appearance of even greater boldness than it had then. It was based on foresight, hope and courage; and it has been vindicated by results.

The large capital expenditures projected and authorized were indispensable to the improvement in service and the economies in operation that have been secured. The regulating authorities and public have not let the railways make some of the advances in rates that have been needed. But they have not made some of the large reductions that have been demanded; and the increase in net operating income has largely justified the bold investment made by being greater in proportion than the increase in investment.

The railways will have in 1927 and in future, as they have had in the past, to resist demands for unreasonable increases in their costs and reductions of their rates. Their resistance has not always been and will not always be successful. But the American public does like good service. It does respect and give confidence to men and institutions that achieve things, if the achievements are made known to it in terms that it can understand. The program of improvements in plants and operation announced in 1923 and since carried out has not only bettered service and increased net operating income, but has helped create a sentiment more favorable to letting the railways prosper than has existed for many years.

Southern Pacific's "Sunset Limited" in Southern Part of New Mexico

Expect Good Business to Continue

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Railroad Heads Expect Good Business to Continue

Capital expenditures probably will be on as large scale as in recent years—Views on regulation

IT is the consensus of opinion of railway executives that traffic in 1927 will be about the same as it was in 1926. They anticipate that capital expenditures will continue at about the same rate as within recent years. They believe it is desirable for a larger proportion of new capital to be raised by the sale of stock, and that many railways are approaching the time when they will be able to do this, but that the net return earned, especially by railways in western territory, must increase before most companies will be able adequately to finance stock issues.

They believe that the provisions of the Transportation Act should be so changed as to eliminate the necessity for the formulation of a general plan of consolidations by the Interstate Commerce Commission and as to make consolidations voluntary with the approval of the Commission. Most of them are opposed to other railway legislation, and especially to legislative rate making by Congress, although some believe something definite needs to be done to so relieve the Commission as to enable it to do its work better.

The foregoing summary of the views of the executives is based upon replies received by the *Railway Age* from the heads of most of the important systems to a questionnaire recently sent to them by this paper. This questionnaire related to the following matters:

1. Prospects of traffic in 1927?
2. Whether, in order to handle prospective traffic satisfactorily, it will be necessary for the railways to continue to invest capital for improvements and expansion on as large or even a larger scale as they have within recent years?
3. Whether the relationship between capital expenditures for new equipment and for other improvements will be different from what it has been in 1926; and, if so, in what way?
4. Whether it is desirable and is becoming feasible for the railways to finance more largely by the sale of stock than they have within recent years?
5. What changes in government regulation now being proposed it is believed should be (a) favored or (b) opposed, in the interest of good and economical service to the public?

The answers received are published herewith.

Good Railroading Helps Business

By R. H. Aishton
President, American Railway Association.

A REVIEW will show that there has been a longer period of good business, without periods of severe depression, than has ever heretofore existed in this country. One of the principal reasons for this condition has been adequate and dependable transportation. This adequate and dependable transportation has made unnecessary the old practice followed in this country for generations of laying in large stocks in advance of actual requirements, in anticipation of car shortage and congestion which formerly took place at certain seasons of the year.

The railroads, during 1926, have handled the heaviest business in their history without transportation difficulty and practically without car shortage. To our knowledge there has not been any stocking up of goods. This automatically means that there should be continued buying in regular normal quantities, with no violent fluctuations in the trend of purchases.

If this assumption is correct, then we can only conclude that business will continue in practically the same seasonal volume in the early months of 1927 as it did in 1926. For the balance of the year 1927 the controlling factors will be unknown developments in crop conditions and in the foreign industrial situation and other economic uncertainties of the future which cannot be analyzed and may not materialize.

Views of Eastern Executives

Excessive Demand for Unproductive Improvements

By E. E. Loomis
President, Lehigh Valley Railroad

1. I see no reason for expecting any important reduction in freight traffic during 1927. Conditions throughout the country are fundamentally sound, I believe, and there is no reason for pessimism. The coming year, I think, will see the railroads called upon to give a full measure of the efficient and prompt transportation service for which they have established such an excellent reputation in 1926.

2. It seems to me there is every reason for expecting that railroads must continue to build up their plants on the present or even greater scale in the years to come, if they are to meet the demands of an ever growing America.

3. Capital expenditures must go into more efficient terminals, power and rolling stock, better track and bridges and generally follow the lines of development which have enabled American railroads to make such an excellent showing in recent years.

4. The Lehigh Valley does not contemplate any new financing in 1927. So far as other roads are concerned, it seems to me that a number of them, which must do something of this sort in the near future, are rapidly approaching a position where they can raise funds by the sale of stock, provided nothing untoward happens in the meanwhile. Railroads are being confronted, however, with so many demands for expenditures, on account of what may be termed non-productive improvements, that a situation of considerable seriousness is being developed. Demand for the wholesale elimination of grade crossings, installation of automatic train control and similar items of a costly nature which, in themselves, may be valuable, but which do not serve to increase a railroad's traffic or its revenues, are presenting a greatly increased problem to the railroads and are bound to have an effect upon the showing they are able to make.

The steady advance in taxes, especially state and local taxation, likewise affects this situation. In some states we are confronted with the spectacle of the railroads, among others, paying heavy taxes, and having part of this money used for the construction and improvement of highways. These highways soon develop heavy traffic. As their use increases, a demand for the elimination of railroad grade crossings arises, and then the railroads are called upon to pay the major sum in the elimination of these crossings. Not only must the railroads add the interest on the heavy expense this work entails to their costs, but the improvement itself is promptly taxed by the community where it is located.

5. I favor continuance of the legislative holiday for the railroads. A simple amendment to the consolidation clause of the Transportation Act, permitting the merging of lines when such can be definitely proved to be in the public interest, would seem sufficient to meet the present situation in that respect. Passage of Senator Gooding's bill, reducing the interest rate on the government's loans to certain carriers, would also seem to be justified. On the other hand, I think it necessary that Congress should set itself on record against injecting rate matters into politics through the attempted enactment of such bills as that abolishing the Pullman surcharge, or interfering in the calm, judicial study of such problems by the Interstate Commerce Commission.

Traffic Prospects Are Good

By Agnew T. Dice

President, Reading Company

PROSPECTS of traffic in 1927 are good.

2. It will be necessary, to handle prospective traffic satisfactorily, for the railways to continue to invest capital for improvements and expansion on as large or even a larger scale than in recent years.

4. The Reading Company does not contemplate doing any new financing during 1927. It is desirable for railways to finance through the sale of stock rather than through bonds, where it is possible to do so, and I think it is becoming increasingly feasible to do more of that.

Improvements Needed to Keep Down Cost

By J. M. Davis

President, Delaware, Lackawanna & Western Railroad

1. JUDGING from the indications, our present prosperous condition should extend well into 1927, at least until the 1927 crop outlook is determined. It naturally follows, therefore, that the railways may anticipate a continuance of, and possibly an increase over the traffic handled in the year 1926.

2. It will be necessary for the railways to invest capital in the future for improvements and expansion on even a larger scale than in the past; particularly will this be necessary if the railways are to be enabled to continue to keep the cost of producing transportation within reasonable limits. The time will soon come when they will have achieved, through intensive development, the maximum economy from the present railway plant, and further reductions or control of costs can only be attained through additional large capital expenditures.

3. I do not think the relationship between capital expenditures for new equipment and for other improvements will differ from what they were in 1926.

4. In my opinion, whether it is desirable and is becoming feasible for the railways to finance more largely by the sale of stock than they have within recent years cannot at this time be definitely answered. The success of railway financing by the sale of stock hinges largely upon the factor of whether the railways will in future be permitted earnings that shall represent to them a reasonable wage for the service they perform, and enable them to compete in the open market with other industries for the capital they will require.

5. I believe the greatest possible good to the railways could be accomplished through simplification of the many laws now on the statute books pertaining to railway operation. Their multiplicity and duplication is a hampering influence and an expensive one.

Railway Situation Most Satisfactory for a Long Time

By P. E. Crowley

President, New York Central Lines.

1. THE indications are that 1927 will be a year that might be termed generally satisfactory, so far as the railroads are concerned, in that the prospects for the volume of traffic do not, at this time present any unusual outlook. From the information we can gather, there are no bad spots in business in our territory. There has been a little slowing up in some lines; but, generally speaking, the outlook is favorable.

There seem to be few conditions, other than wage increases recently awarded, that should encroach upon the net earnings, assuming that the volume of business generally expected for the year which we have just entered materializes.

2. Our expenditures for equipment, materials and sup-

plies during 1927 should be normal, based on operations and volume of business.

The present physical condition of the railroads and their supply of equipment seem good. The best answer to this is the history of the large volume of traffic which appears to have been satisfactorily handled.

4. The New York Central Lines have not, at the present time, need for any large amounts of new money for immediate use on capital account. It is, of course, impossible to tell what requirements may develop during the coming year. The New York Central is now in a position to provide additional capital, in part at least, by the sale of its stock. In 1924 $25,000,000 of increased stock was offered to stockholders and taken by them.

5. I do not believe there will be much, if any, progress during the coming year in railroad consolidations, unless the Parker bill, now before Congress, or some other bill which will authorize consolidations to be made, shall be passed. As the law now stands, consolidations must await the final grouping of all the railroads of the country into a limited number of systems because the Transportation Act, while it authorizes consolidations, provides that they shall only be made in conformity with such final grouping. As there seems to be no likelihood of the Commission being able to decide upon and announce a final grouping in the near future, consolidations must necessarily await legislation lifting this ban.

In the meantime some progress in unification has been made by acquisition of stock, taking of leases, etc. Consolidations, when they shall become possible, should be made along business and economic lines, so that there may gradually grow up in the country a number of well-balanced systems. Railroad systems should grow gradually through construction and amalgamation, and there should be no attempt to make an arbitrary and general advance grouping. Each situation, as it arises, should be studied by itself and with regard to its merits and to the general situation.

The passage of the Parker bill will be in the interest of the public as well as the railroads. It will enable progress to be made in carrying out the intent of the Transportation Act in regard to consolidations as to which we are at a standstill.

The railroad situation, as a whole, is more satisfactory than it has been in a long time. As the roads have prospered, they have been able to give better service, and there is, on the part of the public, the shippers and the companies, a growing feeling of reciprocal satisfaction over the situation. The most pressing problem confronting the railroads is the necessity for making, pursuant to the jurisdiction of public authorities, expenditures for improvements which do not enhance the capacity of the property and do not, in themselves, yield a sustaining return.

The railroad is viewed, from a regulative and legislative standpoint, as a public institution, from which it seems expedient to exact many things beyond those required to convey persons and property; yet it must survive as a business, if it survives. This is an anomaly which requires that the business, if business it is, must absorb burdens as a part of its current existence from which other forms of enterprise are immune. This may be all right during a period of increasing returns and expanding volume. If, however, during such a period the wave of obligation has acquired an increasing momentum, it may be serious. For instance, these burdens may reach a maximum in a period of diminishing returns, with the result that the capital structure and other obligations of the railways may have reached the point which will render it difficult, if not impossible, to reduce rates in a time of declining prices in other industries.

Needed Railway Legislation

By E. J. Pearson

President New York, New Haven & Hartford Railroad

1. THE many factors involved make it impossible accurately to forecast the volume of freight traffic during 1927. Unless there is an extreme depression in business, which from the present outlook seems unlikely, there should not be a great variation between the volume of freight business in 1927 and 1926.

2. There are already indications that transportation in some of its features is commencing to be crowded; also that transportation capacity, which has been responsible for the good service that has been and is being furnished, is the result, in part, of what might be called the "fat" still remaining from earlier expenditures for improvements and equipment. Carrier capacity must be still further increased, coincidentally with traffic growth, if there is to be continuance of the high class of service so necessary to the development and growth of the country's business.

3. No marked change is indicated in the relation between capital expenditures of different kinds.

4. A certain amount of the financing necessary to insure continuance of good transportation should be done by issuance of stock, and, obviously, railway credit should be such as to make this possible. Certain railroads, fortunately, have been able to accomplish this.

5. An amendment permitting voluntary consolidations by the railroads themselves, subject to the approval of the Interstate Commerce Commission, would be a step in the right direction.

Another very important problem is that of relief of the Interstate Commerce Commission from the burden imposed by the vast number of individual rate cases being brought before it by individual shippers. This may involve the performance of much of the work of rate construction by joint committees of the railroads in each rate region, directly assisting and co-operating with the Commission. Such committees should, perhaps, be charged with the responsibility of co-operating with the Commission and acting fairly to all, without prejudice and free from every possible source of selfish interest.

Within the recent period of a few years, a picture has formed which clearly shows the value, to the public, of good transportation. The government charges incidental to Federal operation approximated $600,000,000 annually. One in high authority was quoted a few years ago, when congestion was the order of the day, to the effect that losses to the public from partially inadequate transportation approximated one billion dollars annually. Recent estimates indicate advantages from present good transportation at from several hundred millions to one billion annually. It, therefore, stands out plainly that the value of good transportation to the public is somewhere from one to two billions of dollars annually.

This can only be retained permanently by good railroad credit. Credit is the working tool of the railway managers by which expansion, from time to time, of plant and equipment can be provided—and such expansion is essential to the continuation of good service for gradually enlarging traffic. The picture shows clearly that the big advantage to the public arises from good transportation, not from the gradual but continued attrition of rates and revenues.

Legislation would also be desirable on the following points:

If credit is to be safeguarded, the annual basis for determining railway prosperity or poverty should be substituted by provision for averages over several preceding years; this to include relevant matters of reserves and recapture.

The responsibility of the Interstate Commerce Commission for good transportation for the public necessitates the establishment of simplified rate scales equitable from every viewpoint, and that there should be the same procedure for readjustment of a rate downward, as upward.

Competing water routes should be brought under the same regulation by the Commission as the railways, if railway credit is to be maintained for the large advantage outlined.

Traffic May Hardly Equal That of 1926

By F. H. Alfred

President, Pere Marquette Railway

1. FORECASTS of railroad traffic to cover a twelve-month period must take cognizance of the new maximum which was established as the record for car loadings for 1926. At the time that this is being written, the indications are positive that the new aggregate will be nearer the 54,000,000 mark of loaded cars than the 53,500,000 mark, which is a substantial margin over 1925. That is a record which we can hardly expect for 1927 inasmuch as the car loadings were greatly spurred up by the British strike of the coal miners and the consequent tidewater movements for the purpose of fueling shipping. This loss to business through the British strike settlement, however, will be more than compensated by the greater trade which the countries will exchange. Strikes have a paralyzing effect on business and the consequences are far reaching.

While there has been a recession in the automobile industry in the territory served by the Pere Marquette, conditions all indicate optimism. The manufacturers of automobiles predict a good schedule for the month of January, and in the furniture industry, which is also centered in the territory, there are a number of extensions to plants under way. Several new industries or consolidations and expansions of old ones have occurred during the present year.

Of course, there is always the underlying pivotal condition of the crop outlook around which any forecast of conditions over an extended period revolves. These conditions are too far remote to enter into the equation. In Michigan, crop conditions are becoming less and less a tonnage factor, as far as the railroads are concerned. The bulk of the agricultural, orchard or garden commodities produced are consumed at home. In may cases, what handling does occur is by motor truck to the nearest county town or manufacturing center. One generation ago Michigan railroads were handling a vaster amount of locally produced farm tonnage. Railroads in Michigan are not deploring the loss of this agricultural movement in the greater tonnage brought to them by the industries. This home market is a necessary consequence of industrial development. Taken all in all, we will be fortunate if the railroads are called upon to handle the same amount of tonnage in 1927 as they hauled during the year 1926.

2. The American railroad industry, because of the vastness of its net work, the magnificent distances and the load of freight to move, together with the seasonal demands, in reality, invites large investments of capital for improvements and expansion constantly. We have seen what the accelerated speed of the freight service has meant to the business of the country generally. Of course, American business is now geared up to that standard and there can be no recession from this accelerated speed without involving considerable loss to business itself. This new service follows closely, of course, in the wake of the tremendous investments to rehabilitate American railroads following the great war period and government operation of the lines. Judged by the unusual conditions of 1926, there are no indications that any prospective traffic will make imperative any unusual investments for improvements and expansion. The tidewater coal situation with the shortage of open top equipment, which at certain times was just half a day in excess of the immediate demands, is likely to be relieved by the settlement of the coal strike in Great Britain, and the movements will take their normal routes hereafter. The only other situation where equipment enters is that of the refrigerator cars and the Buffalo embargo of the early fall. This situation was due more largely to the shipper's uncertainty than to any shortage of equipment. The shipper forwarded his commodities from California to the east not knowing their final destination. Then would follow diversion orders and the consequent delays and congestions in the Buffalo gateway. No expenditures of money either in equipment or in additional facilities would avert such a situation.

3. The performance of American railroads as a whole during the past two years does not indicate that there was any stressing of capital expenditures along any particular line to the disadvantage of another. The Florida embargo and the fruit congestion at Buffalo, as already explained in the case of the latter, were due solely to unusual conditions. In the case of the Florida movement, there was a boom and the consequent difficulties at the gateways into Florida. Such a situation is not likely to arise anew. In the case of the approach of a car shortage of open top cars during October, this was largely due to the untoward demand for coal at tidewater incident to the British coal strike, and in the case of the fruit embargo at Buffalo, the situation was brought about through the California producers shipping eastwards without any definite orders. In the press of heavy movements of freight of all kinds, the work of diverting, etc., involved some work to the railroads that is beyond the functions of a common carrier—that is storing shipments in refrigerator cars en route.

5. If we must have consolidations, it would be well if the Transportation Act were so amended as to assure greater facility in bringing about voluntary consolidations. That is about the only matter with which the national government should deal in the way of railroad legislation.

The state, county and local governments, however, could greatly assist the railroads through a more conservative policy in making local improvements on which railroads have to pay the taxes. The present year 1926 will be marked by the highest taxes in the history of American railroads, varying from $400,000,000 to $420,000,000. That represents six per cent and over of the gross earnings of the railroads. That amount is in excess of the return on capital invested in railroads, and

just such a high rate may have a bad effect on future railroad financing. It is quite a difficult matter to cut down taxes, and, at best, any economies effected this year would inure to the benefit of the taxpayers only a year hence. So, it would seem, that the present is the proper time for retrenching.

Views of Executives of Southern Railroads

Commission, Not Congress, Should Regulate Rates

By J. R. Kenly
President, Atlantic Coast Line Railroad

1. THERE is reason to believe that during 1927 traffic in the southeast will continue to be heavy. Material progress is being made towards financing that portion of the cotton crop that will be warehoused for future marketing. If this plan is adhered to and the cotton acreage materially reduced, I think the present situation may result in benefiting the farmer's position by bringing him to a greater realization of the need for a better balanced system of agriculture and a better understanding of the benefits that accrue from concerted action and the orderly marketing of farm products.

2. From recent indications, the railroads of the southeast will be required to continue to make large capital expenditures for improvements and expansion. There is a growing realization of the many natural resources that the south contains and of the possibilities for sound economic development. Large amounts of new capital are being invested in water power developments and various kinds of manufacturing and commercial enterprises and the railroads will be required to exert themselves to keep their facilities abreast of the development of the section.

3. So far as this company is concerned, it is probable that expenditures during 1927 will be for improvements and betterment of way and structures rather than for the construction of new lines. The budget of this company for additions and expenditures for the year 1927 has not yet been formulated. Expenditures for capital account during 1926 were unusually heavy and will be considerably less for the year 1927 for the reason that most of our current improvements will be finished during this year and the early part of 1927.

4. It is apparently becoming more feasible for the railroads of America to secure the funds that are in constant demand for improvements by the sale of stock rather than by the issuance of bonds. The proportional amount of bonded indebtedness of the American railroads is already unduly large. More partners rather than creditors are needed in the railroad business. In order to secure these partners, the public must be thoroughly convinced that the policy of the state and federal government towards the railroads is stabilized to the point where there is recognition of the right of capital invested in railroad enterprises to earn a fair return. Unless there is this confidence, the public will not risk its money in railroad stocks.

5. There is one situation pending which, I think, is fraught with danger for the carriers and, if carried through, is liable to react unfavorably on general business. I have in mind the proposal now pending in Congress to abolish the Pullman surcharge. In the nature of things, a legislative body cannot properly consider the facts involved in fixing a railroad rate. It has neither the machinery nor the time for investigation and proper consideration of the subject. It is essential, in order to obtain a just conclusion, that government regulation should be by the Interstate Commerce Commission which was created to consider and is equipped to investigate and fix a fair and reasonable rate. It is therefore sincerely to be hoped that the pending plan of regulating passenger rates by legislative action in Congress will be resisted and will fail.

Business Promises to Continue Good

By L. A. Downs
President, Illinois Central System

1. ESTIMATES of the future must necessarily be founded largely upon the experiences of the past. For that reason, it is encouraging for us at the beginning of 1927 to recall that in 1926 there was unprecedented activity in virtually all lines of business, accompanied by a record-breaking volume of railway freight traffic. Both in the number of cars loaded with revenue freight for movement by the railroads and in the number of tons carried one mile, the traffic of 1926 exceeded the traffic of previous years by substantial margins. The most encouraging thing about the large freight traffic of 1926, from the standpoint of 1927 prospects, is that it was occasioned entirely by current demands. There was comparatively little forward buying and shipping; business operations were carried on with exceedingly meager stock; consequently, there was no great element of inflation in the traffic of 1926 comparable with that to be found in many other years of increased traffic in the past.

The deduction to be drawn from this state of facts is that business on the whole, despite possible minor disturbances, promises to continue good in the immediate future. Railway freight traffic, consequently, should continue to be heavy. The current needs of our population are greater than ever before; there is no great accumulation of manufactured goods on hand to supply these needs; therefore, there must be a constantly heavy traffic movement to keep pace with everyday requirements for consumption. To the extent that good railway service has made possible such a revolution in business methods as that outlined above, it has removed one of the most speculative elements in the conduct of business in general, and the result has strengthened the railway business as well.

2. Expenditures by the railroads for the expansion of their capacity necessarily are governed fairly closely by traffic requirements. In my opinion, there is nothing more certain than that railway traffic will continue to grow. In the past it has always grown more rapidly than population; I know of no good reason for it to do

otherwise in the future. Constant increase in railway capacity therefore will be required. The improvements wrought by capital expenditures, moreover, make it possible for the railroads to perform increased service with increased efficiency and economy. The opportunities to hold down operating expenses by careful spending of money for improved facilities will, in my opinion, always continue to interest railway capital.

4. Closely related to the subject of capital expenditures is that of financing such expenditures. It is generally felt that protection of railway credit as a whole calls for proportionately more financing to be accomplished through the sale of stock. As railway credit improves, financing through stock sales becomes more extensively possible. To effect the elasticity of financial structure to be gained in this manner, however, there must be considered the lower cost of money borrowed on security. These opposing elements must be weighed in the light of individual requirements.

5. The future of our railroads depends to no small extent upon the character of regulation applied to them by governmental bodies. It is commonly agreed that reasonable regulation of the railroads is wise. Those measures which are reasonable should be most vigorously supported; those which are unreasonable should be no less vigorously opposed. Among the regulatory measures which are current at this time, the proposed enactment of legislation that will enable the railroads to make voluntary consolidations falls within the former class, and those measures which seek to make rates by legislative enactment fall within the latter class. It is of the utmost importance that the railroads use every proper means to impress upon the public the great need of constructive action in these as in all other matters of regulation.

Sound Financing Requires More Stock

By Whitefoord R. Cole
President, Louisville & Nashville Railroad

1. MEASURED largely by the unexcelled volume of traffic the American railroads efficiently and satisfactorily handled in 1925, and considering the general business and economic stability existing throughout the country as a whole, I think the prospects for at least a part of the year 1927 appear particularly favorable. Practically all indications point to a continued growth and expansion in commercial progress and I see no reason why the railroads will not continue to handle their proportion of the increased business.

2 and 3. We have no information showing the extent of the investments the railroads contemplate making in 1927, but inasmuch as the demands of commerce seem likely to continue I should think the capital expenditures, both in total amount and as between those made for equipment and for other facilities, would largely approximate the yearly amounts expended during the recent past. Such improvements probably may not exceed, in any material degree, the average made in the past few years because a certain portion of the investments since the end of federal control were necessary to rehabilitate the railroad properties which are now in a high state of adequacy and efficiency. I may say that the improvements so far contemplated or authorized by the Louisville & Nashville Railroad are substantially the same in character and amount as those at the close of 1925.

4. It appears most desirable for the railroads to finance their investments more largely by the sale of stock than has been the case heretofore. Practically all —I believe over 90 per cent—of railroad financing in recent years has been accomplished by the sale of equipment trusts and mortgage bonds; consequently in many cases too large a proportion of their capital obligations is represented by bonded debt. Sound financing will, in the future, require that a large part of new capital be raised by the issuance of stock. The feasibility of this procedure depends almost wholly on the ability of the carriers to show a satisfactory earning power so as to make their securities attractive to the investor.

5. With the better understanding now existing between the railroads and the general public, and lower operating costs brought about by improved managerial efficiency and co-operation of the employees, railroad income has improved with a consequent strengthening of their earning capacity. The continuation of these fortunate conditions, and particularly the continued freedom from the enactment of new governmental regulation not distinctly in the public interest, in my opinion, constitute the strongest factors calculated to insure the future stability of railroad operation and credit, as well as the continued high mark of industrial progress and prosperity which this country now enjoys.

Southeastern Traffic Probably Will Increase

By J. J. Pelley
President, Central of Georgia Railway

THERE is no apparent reason to anticipate a slackening of freight traffic in 1927. So far as the Central of Georgia is concerned, we anticipate that the volume of traffic will exceed that of 1926, which will be a record year. The management is going ahead with preparations based on that expectation, and will carry out a program of improvement and expansion of the railway's facilities.

The drop in the price of cotton in the fall of 1926 was regarded with apprehension, and must unquestionably be reckoned with, but in my opinion it will not slow down business to the extent that was at first anticipated. Agriculture in the Southeast has become diversified, and this section has witnessed a marked development along industrial lines that renders cotton a less important source of income than was the case in former years.

The facility with which the railways have handled traffic in 1926 bears witness to the soundness of managerial policy in making large capital expenditures for the improvement of the properties during recent years. There is no reason to doubt that the demand for transportation in the United States, particularly in the Southeast, will continue to increase. If this demand is to be met, the railways must continue to expand and to improve themselves in the essentials of service. This cannot be accomplished without an uninterrupted flow of capital expenditure.

Capital cannot be coerced. It can only be attracted. If the public wants good railway service, it will allow

the railways a rate of return that will enable them to attract added capital for further improvement. Such a public policy will manifest itself against regulatory measures that are unduly restrictive.

Large Capital Expenditures Must Continue

By W. J. Harahan
President, Chesapeake & Ohio Railway

1. THE situation for 1927 will perhaps be about the same as for 1926. Our freight business should hold up, but our passenger business still seems to be decreasing on account of automobile competition.

2. I think it will continue to be necessary, in order to handle the prospective traffic situation satisfactorily and economically, to invest a large amount of capital for improvements and expansion within the next few years. As far as this company is concerned we expect to invest at least as much as in recent years.

3. Our capital expenditures for 1927 will be largely for improvements other than new equipment, which we deem necessary in order that we may balance our facilities.

4. I think it is desirable and is becoming feasible for the railroads to finance more largely by the sale of stock than has been the case in recent years. This is all contingent however on the proper treatment of the railroads, allowing them to earn sufficient so that their credit may be well developed.

5. I do not think any changes should be made in government regulation except perhaps that portion of the Transportation Act dealing with consolidation. I think that should be put on a voluntary basis rather than compulsory. I think that the principal evil to which we are likely to be subjected insofar as legislation is concerned, is the attempt by some members of Congress to introduce direct regulation of rates by Congress instead of through the Interstate Commerce Commission. I think this tendency should be strongly opposed.

Investment on Scale of Recent Years Still Needed

By A. C. Needles
President, Norfolk & Western Railway

1. IT is too early to estimate with any degree of accuracy the volume of freight traffic for 1927. The cotton situation of the South, the settlement of the English coal strike and the uncertain situation of Europe will affect business adversely.

2. It will be necessary, in order to handle prospective traffic satisfactorily, for the railways to continue to invest capital for additions, betterments and improvements as they have been doing in the past few years.

3. Whether the relationship between capital expenditures for new equipment and other improvements will be different from what they have been in 1926 will depend upon new construction which may be undertaken.

4. Whether it is desirable and feasible for the railways to finance more largely by the sale of stock than they have within recent years depends upon the financial structure, credit and earning capacity of each carrier.

5. I believe that any proposed government regulation looking towards a decrease in the revenues of carriers should be opposed. Consolidations can most advantageously proceed if permitted voluntarily, when in the judgment of the Interstate Commerce Commission they are in the interest of the public.

Executives in Central West and South West

Stock Issues Depend on Return Earned

By Hale Holden
President, Chicago, Burlington & Quincy Railroad.

1. AT this time I see no substantial reasons to believe that the freight traffic in 1927 will not equal that of 1926, although all predictions for the coming year are necessarily based upon crop results and the volume of the large items of tonnage, without interruption by strikes or other artificial reductions.

2. In this part of the territory, the railroads are already well equipped to handle in 1927 the same volume of traffic that was handled in 1926, and to take on without substantial enlargement a considerable increase in volume. For this reason I presume that further investments of capital for additions and betterments will likely be for additional economy in operation. Because of the restriction upon immigration, and the slow but steady improvement in the agricultural situation, vacant territory in the west is not finding new population at the rate that prevailed in former years, and therefore with occasional exceptions I do not anticipate the building of much additional mileage in western territory during the coming year.

3. I know of no reason to anticipate any substantial change in 1927 in the relationship between capital expenditures for new equipment and for other improvements from that in 1926.

4. In some portions of the country it seems more feasible than for many years for railroads to finance themselves by the sale of capital stock, although that condition has not yet become uniform over the country. In western territory it should now be evident to those who have attacked the Transportation Act of 1920 because it contained a guarantee of a fixed return, that it contains no such guarantee because the railroads in the western group are still earning but little above 4 per cent on their property investment, and until a larger return is earned it will likely not be possible to raise additional capital upon satisfactory terms through the sale of stock.

5. I believe that the Transportation Act of 1920, notwithstanding the shortage of return which the western roads have been able to earn under it, still continues as the best system of law regulating the railroads that has been enacted and that it should be continued without substantial change, excepting in those particulars which after careful study may improve it and make it more workable. In the latter particular, the provisions providing for the consolidation of the railroads into a limited number of systems needs amendment, and legislation for that purpose has already been introduced and should be passed. What the railroads need as has been demonstrated by the successful service of the last four years, is relief from more legislation, excepting in the particular above referred to, and a continued opportunity under fair rates and temperate regulation to demonstrate their ability to efficiently serve the public.

General Conditions Improving

By T. C. Powell

President, Chicago & Eastern Illinois Railway

1. THE predictions made for 1926, anticipating prosperous business conditions and large railroad traffic, have been more than fulfilled, and I look forward in 1927 to a substantial volume, although perhaps not any greater than in 1926, which passed nearly all records.

The confidence of the people of the country in the future of the United States is the only thing necessary to insure the continuation of the present prosperity, particularly as we now know that the world conditions are settling down to a more normal basis.

By November, 1926, it was evident that the strike in the British coal fields which had lasted for an unprecedented period, had utterly failed and the men are flocking back to the mines as rapidly as they can be given work.

It is significant that while the strain has been severe, there has been no evidence of a breaking down of British business morale.

The present physical condition of the railroads throughout the country is good and their supply of equipment has been ample, while the supervision of the Car Service Division of the American Railway Association has insured the proper distribution of this equipment to take care of the seasonable movements in different parts of the country. The orders for new motive power and equipment already reported by the press, are an indication of the purpose of the railroads to keep ahead of the demand.

As I said last year, it seems clear that the public is still looking forward to the time when standard articles may be purchased at a fair price and with relation to the income of the purchaser, and among these items may be included that of rent. High rents are based on increased land values which have been inflated in many cases, and upon increased construction costs, but except as to certain congested localities, the inevitable trend is toward rent reductions rather than rent advances. Such reductions if and when they occur, will be generally beneficial, because the difference will usually be expended in other directions, but the threat of high rents has tended to encourage the construction of a large number of small, but comfortable houses, to be owned by the occupant, thus adding to the substantial character of the population living in the urban districts.

I pointed out last year that never before had it been possible to buy so many things of substantial, intrinsic value on the basis of time payments and I believe that this tendency continues, with benefit to the purchaser, the merchant and to the manufacturer.

Installment buying encourages stability in production, and stability in production means stability in employment and, therefore, a continuous exchange of labor for money return, and the reports show that the capacity of the people of the United States, while accumulating money in a savings bank, seems to have been enormously increased during the past year, notwithstanding the heavy expenditures for luxuries and amusements.

Real wealth is produced from the soil and not from speculation, and an effort should be made to regulate soil production so as to meet the demands of a steadily increasing population, but within reasonable areas of distribution and not substantially in excess of that demand.

I am more than ever impressed with the necessity, and common sense, of the farmer and the manufacturer undertaking to produce a better article at a moderate price, than an enormous amount of mediocre products at a price only slightly below what a first class article or commodity should bring.

The farmers, including the cotton planter and the fruit grower, are disposed to disregard the difficulty of marketing a large production, but have simply addressed themselves to stimulating the land and increasing the production regardless of the inevitable consequences of suffering from a demand far below the supply.

Abnormally high prices on any farm products do not necessarily mean that through the success in one year, the farmer has acquired permanent prosperity.

The tendency resulting from high prices is to constantly increase the production until a great excess has been thrown on the market. Perhaps it is only through these experiences that a more responsible and clear-headed conception of the law of supply and demand can be obtained, but these experiments are costly.

This is the condition in the case of cotton, but the redeeming feature in the cotton situation is that, whereas the high prices of the raw material for the last two or three years, have restricted manufacturing abroad while encouraging the competitive production of cotton in foreign countries, the present lower price of cotton will induce sales in greater volume to the manufacturers. A volume of cotton production, based upon the marketable consumptive demand will result in greater uniformity of return and should encourage and result in more economical production.

The great advances that have been made since the war in the development of chemistry as applied to farm products, have been frequently ignored as a source of profit to the farmer, but it is undoubtedly a fact that in many items, such as the utilization of a wide range of vegetable oils for food and in the arts, chemistry has also added to the income of the farmer.

Railroad development constantly calls for new facilities and new designs, and the figures show that expenditures for these purposes have been going along in proper ratio during 1926. I see no reason for any substantial change occurring in their relationship during 1927.

I believe that the railroad situation generally will be improved if and when Congress passes an amendment to the Transportation Act of 1920, clarifying the method of effecting railroad consolidations and insuring that there shall be no uncertainty as to the scope of such

consolidations, so that there shall be included in the railroad systems of the country, all the railroads large and small, necessary to afford adequate transportation to the people of the United States.

Normal Capital Expenditures Probable

By W. B. Storey
President, Atchison, Topeka & Santa Fe System

1. SO far as we can foresee there should be about the same volume of traffic in 1927 as in 1926, except for some abnormal condition not now indicated, to swell or to diminish the amount of business the railroads will have to handle.

2. The railroads ought to spend about as much for capital purposes as the average of the last four years. This may be assumed as the normal growth of the railroads to keep pace with the normal growth of the country. No need for more than this is indicated.

3. I can see no reason for any radical change in the proportion needed for equipment compared with that needed for other purposes.

4. I note that several roads are at the moment preparing to offer stock for sale to raise money for capital purposes. This is as it should be. Due to inadequate earnings, practically all railroad financing since government control has had to be by borrowing through the sale of bonds. It is a wholesome sign that people are beginning to put money into railroads as owners instead of as lenders.

5. There are no changes in government regulation now being proposed which seem to me necessary, and I believe therefore they should all be opposed. While it might be desirable to have consolidations made entirely voluntary and permissive, in practice this is about what is being done today, so no action seems necessary on this score.

Traffic Expected to Equal That of 1926

By J. S. Pyeatt
President, Denver & Rio Grande Western Railroad

1. GREATER manufacturng efficiency, improved methods of distribution, reasonably satisfactory agricultural conditions and substantial development of natural resources, will, at the end of 1926, have made possible the greatest volume of traffic handled by the railroads since federal control. These business activities, out of which is created traffic for the railroads, are fundamentally sound and healthy. There is every indication these conditions will continue through 1927, and it is my belief prospects for traffic in that year will equal those of 1926.

2. I believe, in order to handle the traffic requirements of the country satisfactorily, it will be necessary, both in the interest of service and economical operation, for the railroads to continue to invest capital for improvements and expansion on at least as large a scale as they have within recent years.

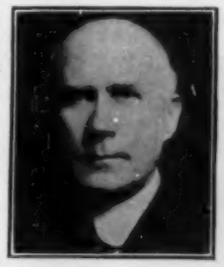
3. As to the relationship between capital expenditures for new equipment and for other improvements to be made in 1927, compared with 1926, they will be equal, if not somewhat larger.

4. As to financing more largely by the sale of stock, this is more desirable, always, and in some cases more feasible.

1927 May Prove Best Year Yet

By William Sproule
President, Southern Pacific Company

1. NINETEEN TWENTY-SIX has been a year of record freight traffic for American railroads. The traffic volume compared with previous years reflects the current prosperity. Predictions for 1927 must rest upon present conditions influenced by such forecast of future variation as can be made. Upon the basis of normal advance in the country's progress there is reason to expect the 1927 volume of railway traffic will compare quite favorably with that of the past year providing nothing unforeseen occurs with depressing consequences. Indeed 1927 may prove the best year yet.



2. Railway capital expenditures for 1926 are estimated by the Bureau of Railway Economics at $875,000,000. This estimate does not seem excessive, for in the seven years since federal control ended such expenditures have exceeded five thousand millions of dollars, representing an addition of one-fourth to the railway investment. Expenditure of this enormous sum, together with increased efficiency in operation, permitted the railroads to handle the record traffic of 1926 without substantial car or locomotive shortage even during the peak traffic months. The roads will, therefore, have ample rolling stock to move 1927 business, with such additions as are necessary for usual growth and for replacement of equipment going out of service. These necessities may be somewhat less than those of last year, but they will still be very large. The desire for more economical operation will require continuance of the policy of improving track and roadbed and structures, enlarging shop and terminal facilities.

3. During the last five years about one-half of capital expenditures has been for equipment and the remainder for roadway and structures, the proportions for 1926 being respectively 43 per cent and 57 per cent. Considering the large additions made in recent years, equipment expenditures may bear a smaller relationship to the total in 1927 than in 1926.

4. It is desirable, but not yet generally feasible, for railways to finance by sale of stock rather than by borrowing the money. Money needed for capital expenditures of recent years has been furnished largely through the sale of bonds. This situation cannot be changed materially until railway stocks have been established on not only a sure but also an adequate dividend basis. In not a single year since the end of federal control, even including 1926, have the railways earned the net return on investment contemplated by the Transportation Act, so the earning power of stocks is not likely to be sufficient to sell stock instead of bonds. The Interstate Commerce Commission, under the Transportation Act, placed the "fair return" at 5.75 per cent, but the average return realized on railway investment in the seven-year period 1920-1926 inclusive is less than 4 per cent.

5. In the coming short session of Congress an absence of railway legislation is desirable to avoid disturbance of fairly satisfactory public conditions. The good service of the railways is generally recognized by the traveling and shipping public and tinkering with the railroad laws is disturbing to everybody without serving practical purpose.

Business Prospects in the Southwest Are Good

By J. M. Kurn

President, St. Louis-San Francisco Railway

1. PURCHASING power which is the basis for all activities, in my opinion, will continue the equal or better of the year 1926 well into the harvest months. For the entire year we must depend upon the results of the basic crops. The moisture generally prevailing throughout the wheat sections justifies favorable prediction for that crop. As to other basic crops, we, of course, will not be in a position to determine until after planted. Manufacturing interests seem to view the incoming year with great favor. Lumber producers predict better results than for 1926 for their industry. The oil industry has to contend with an increased crude production, but recent reports show that even with possible increased production, the consumption will keep pace and reports indicate that the industry is in better shape than it was a year ago. The coal operator surely is in a much more favorable situation than a year ago as his competitor, fuel oil, is not nearly so great. Therefore, the conclusion I reach is that the traffic in 1927 should be as good as in 1926, as far as we are able to forecast at this time.

2. Our program for strengthening bridges, which has been under way to a great extent in 1926, will be extended into 1927. This is quite an expansion program itself and means very heavy expenditure. Our power is equal to any increase in business that may be thrust upon us. Our equipment generally is in first-class condition. We are planning to build 600 additional flat bottom coal cars and have arranged to acquire twenty-five additional express refrigerators. With these additions we will be equipped to handle any business that may be offered.

3. No change in the relation between different kinds of capital expenditures is probable.

4. As to the question of any financing that might be required—would be in favor of adding to the number of partners rather than the number of creditors and, as a consequence, am decidedly in favor of the plan of providing funds by sale of stock.

5. I do not know of any fundamental governmental regulations now under way in Congress. Of course, we are greatly concerned about special efforts that are being put forth to control carriers through process of congressional regulations. I have particularly in mind, notwithstanding consideration given the subject by Interstate Commerce Commission, that Congress is still laboring with the question as to whether the Pullman surcharge shall be abolished. It is my view that the necessities and requirements of the railroads should be left with the Commission and that Congress should not especially legislate on a subject of such importance to the railroads as is the surcharge.

Conditions Favor Big Traffic in Western Territory

By J. E. Gorman

President, Chicago, Rock Island & Pacific Railway

1. THE traffic prospects for 1927 for the various western lines will depend largely upon the size of the crops that are harvested. There is a large increase in the winter wheat sown in Kansas, Oklahoma, and Texas, and with seasonable conditions, there is no reason to presently anticipate that there should not be a splendid crop. Railroad carloadings, which continue very satisfactory, are the best indication of prosperity in the western territory; and, further, I am not unmindful in this connection of the very large amount of business that is presently being handled on improved public highways, which likewise is a distinct sign of greater general activity. General conditions appear to be just as healthy as at this time last year, and with favorable crop conditions I see no reason why we cannot look for as good or perhaps even greater volume of business in 1927 than in 1926.

2. To meet these traffic conditions the Rock Island is giving consideration to one of its largest improvement budgets.

3. The relationship between our new equipment and recommendations for roadway improvements provides for a somewhat larger proportion of new equipment than has generally been recommended in previous budgets.

4. It would of course be very desirable for the railroads to finance these improvements more largely by the sale of stock than they have been able to do in recent years but this is not possible unless they are permitted to earn a fair return on the investment thus enabling them to pay dividends with regularity on their stock issues.

5. One of the disquieting things presently confronting the railroads is Congressional action looking toward the abolition of the Pullman surcharge. The reduction of railroad revenues that would result from this could be compensated only by increased business or by increased rates and in my opinion both the business interests and agricultural interests should oppose the abolition of this surcharge.

Comments of Executives in North and West

Traffic Prospects in Northwest

By C. T. Jaffray

President, Minneapolis, St. Paul & Sault Ste. Marie Railway

1. PROSPECTS for traffic in the states of Minnesota and the two Dakotas for the first part of 1927 are not very good because of the light crops harvested in that territory during the past season. What will be the situation in the fall, of course, depends entirely upon next year's harvest.

2. With the traffic in sight in these three states for the next three months, I do not believe any extra investment in improvements or expansions will be necessary, but I feel the same which as gone on for several years should be carried on.

3. It is hardly possible for the northwestern roads, as such, to change their situation as to capital expenditures for as yet none of the roads in this district could sell stock at par for these improvements.

4. It would be very desirable, indeed, if railroads could sell stock for their improvements, but until the roads can pay dividends attractive enough to put their stock at par or better, this will be impossible—although it is very necessary.

5. I cannot conceive of any more regulations by the government being worth while or which should be put into effect and I believe anything which tends to further restrict the operation of railroads in their income or expenditures should be very vigorously opposed in the interest of the railroads and the public.

Consolidation Provisions Should Be Changed

By Charles Donnelly

President, Northern Pacific Railway

1. THE volume of traffic which the Northern Pacific will carry in 1927 at least will equal and probably exceed that of 1926. The crops on the east end of our system in 1926 were not normal; and with us the crop movement is a factor of first importance. The soil conditions this winter are better than they were at this time in 1925, and the prospective 1927 crops are on an improved comparative basis. The lumber business was spotted in 1926, but equalled that of 1925 in tonnage, and I see no reason why this important freight movement should not be as heavy in 1927 as in 1926. Passenger earnings of the Northern Pacific I believe will be fully equal to those of 1926.

3. The relationship between capital expenditures for new equipment and for other improvements probably will be about the same in 1927 as in 1926.

4. So far as northwestern railroads are concerned, the time has not arrived when any of them could raise any considerable amount of new capital by the issuance of new stock.

5. In my judgment no proposed railroad legislation now before Congress equals in importance the proposed amendments of the consolidation provisions of the Transportation Act. Experience has shown that consolidations are desirable, if indeed they are not necessary, under modern railroad transportation conditions. It has shown, too, that little can be done with effect under existing law. The law should be so changed as to make effective action possible.

Traffic Will Continue Good

By H. E. Byram

Receiver, Chicago, Milwaukee & St. Paul Railway

1. FROM our study of the situation the indications are that the present volume of business will continue well into 1927, if not throughout the entire year; at least there are no indications of any change in the situation as far as we can see at the present time.

2 and 3. It is very difficult to tell what the needs of all the railroads in the way of additions and betterments may be next year, but looking at the situation from the standpoint of performance it would seem that the facilities of the railroads this year have been adequate to meet all requirements and that unless a larger volume of business is offered in 1927 there should not necessarily be any necessity for any unusual expenditures to provide facilities with which to handle the traffic.

4. As our railroad is in the hands of receivers I am not in a position to discuss the question of financing through the sale of stock.

What Congress Will Do Most Pressing Question

By Ralph Budd

President, Great Northern Railway

1. PROSPECTS are for a normal volume of traffic in the northwest during 1927.

2. The capacity of the northwest railroads is considerably beyond any volume of traffic in prospect next year.

3. On the Great Northern the expenditures will be somewhat more for improvements to fixed property than for equipment, but not a very different relationship from that of 1925 and 1926.

4. It is desirable, and in some cases it is becoming feasible, to finance partly by the sale of stock, rather than entirely by the sale of bonds.

5. I believe that any changes that are made in the Transportation Act should be only such as will facilitate railroad operation by railroad

operating forces. The most pressing question is whether Congress will refrain from further adverse railroad legislation.

Improvements in Regulation Needed

Fred W. Sargent
President, Chicago & North Western Railway

1. OUR analysis based on reports of our division freight and passenger agents, general agents throughout the United States, and local agents in our own territory, indicates that the prospects for business in 1927 are good, and will be at least equal to if not greater than in 1926.

2. In order to handle prospective traffic satisfactorily it will be necessary for the railways to continue to invest capital in equipment and in ways and structures; especially is the latter true with reference to railway terminals.

3. I expect the relationship between capital expenditures for new equipment and for other improvements will not vary greatly from that of 1926, although 1927 is likely to show larger purchases of equipment.

4. I do not think it is feasible for most of the western railways to finance under present conditions by the sale of stock. As to those railways whose bonded indebtedness and capital stock bear a proper relationship to each other, I think it more satisfactory to finance by the issuance of bonds, for in this manner money can be secured cheaper and the margin of earnings for the existing stock will therefore be retained on a higher level.

5. With reference to government regulation, I am satisfied it would be helpful if Congress would pass the Parker consolidation bill. I also am sure that the best interests of the shippers, as well as the railroads, would be served if Congress would adhere to that sound fundamental principle that rates should not be made by direct legislation. It is entirely appropriate that legislative acts define general rate making principles, but the application of all classes of rate making should be left to an expert body such as the Interstate Commerce Commission.

I think any attempt to change the method of selecting the members of the Interstate Commerce Commission should be opposed. Every member should be chosen for his ability and capacity to serve and not because he represents any particular interest or comes from any particular part of the country. To select commissioners because of locality would in effect convert the Interstate Commerce Commission from an impartial, administrative and judicial tribunal into one of special advocates for special interests. It is this principle of special advocates for special interests which caused, in my opinion, the United States Labor Board to break down, and we should avoid any such disastrous consequences with the Interstate Commerce Commission.

I do feel, however, that something should be done to convert the Interstate Commerce Commission into a more efficient and businesslike institution. At the present time its proceedings are disastrously costly, and its delays almost unbearable with relation to questions pertaining to important rate structures that ought to be handled with promptness and businesslike efficiency. Recent examples to which I might call attention are the Western Advance Rate Case, and the present pending controversies concerning the readjustment of class rates.

I entertain the very highest regard for the ability and integrity of every member of the Interstate Commerce Commission, but I also am satisfied that there is an opportunity for greater efficiency in handling rate matters, and that important problems involving the rate structure applicable to whole sections of the country, such as the Western Trunk Line territory, ought to be handled by the Commission with more dispatch and vigor.

"Golden State Limited" East Bound Through the "Mesa" Country in New Mexico

Railway Supply Industry Expects Good Business

General conditions present some aspects which characterized halcyon years 1893 *to* 1907

By Alba B. Johnson
President, Railway Business Association

IT seems evident that the railway supply industry and trade are preparing for a larger business in 1927 and for business thereafter generally increasing, with moderate recessions, if any. The emphasis seems to be shifting from way and structures, capital outlays which have absorbed a steadily rising percentage of the total since 1923 to purchases of rolling stock.

A glance at the *Railway Age* classified index shows that almost 60 per cent of the advertisers sell goods or services related to equipment. This is number of concerns. As a ratio of volume, it would be inexact. But common observation confirms the hope that, in any swing from way to equipment, total purchases will at least equal those of 1926. The way and structures contingent, if they are presently to suffer some diminution of share in additions and betterments, have this consolation—that, instead of retiring from the market altogether, which would help bring on a general industrial depression, the roads will be heavily engaged in provision on the equipment side, contributing their quota to the continuance of general business and traffic, and assuring the track and building groups large outlays not alone for maintenance but for additions and betterments; whilst hastening the year in which it will again be their turn at predominance of railway purchases.

A Fallacy Regarding Stability of Purchases

What has been said brings into prominence a fallacy in regard to stability of railway purchases. Suppose the total appropriations for capital improvements, including carry-over, are as much for 1927 as expenditures for 1926, and with cost of maintenance conforming. To a casual eye this might give an impression of stability. Closer examination reminds us that it would be far from this. In analyzing *Railway Age* advertisers we count on both sides concerns evidently selling for both rolling stock and other purposes. To a great extent, however, supply concerns with a relatively large aggregate output have each their eggs in but the one basket. Consequently, without reducing total expenditures, the roads, by a transfer of emphasis and curtailment of buying here and there through the country from industries large and small, could throw thousands out of work, cutting pay-rolls and inflicting temporary impoverishment upon whole communities, whose citizens, as consumers, are the source of railway traffic. Capital expenditures for equipment have actually ranged from 67 per cent of total capital outlays in 1923 to a figure in 1926 apparently below 40 per cent.

Some members of the Railway Business Association are said to be endeavoring, by development of new products or by mergers, to fortify themselves with an equipment business when the roads are stressing that branch and with a way and structures specialty when that department is the major activity. During the war the iron hand of government compelled the manufacturer to step out of his rut and produce some untried thing. He said he could not do this, and honestly thought so. Necessity, however, prevailed, the war was won and the Armistice found, all over the country, managers previously single-service men and now conscious that whoever turns from plowshares to swords, or from pruning hooks to spears, has the agility to turn from plowshares to pruning hooks, from car devices to track appliances.

Salesmen of some concerns are instructed to urge the traffic importance to the roads of evenly distributed industrial prosperity—evenly distributed not only over the year and decade, but over the varied classes of industries. The specific remedy is to program separately appropriations for each general kind of work.

Railway supply concerns, moreover, can, and in many instances do, arm themselves against a slump in purchases from one or more or all their regular railroad customers by carrying lines for non-railroad trade. Some of our members who resolved to introduce this feature have not gone as fast or as far with it as they had hoped, but it is one of those good ideas for which, in due course, we are prone to evolve practice, personnel and arrangements.

An obstacle to stabilizing purchases at all is the influence of the prescribed accounting system. This is mentioned here because there seems to be a possibility of adjusting it soon and because discussion of it is believed to stimulate among the railways zeal for stability. The Transportation Act, Sec. 15a, in one paragraph requires that "annual" income in excess of 6 per cent shall be divided 50-50 with the government. It has been assumed that this left the Commission no choice but to recapture the government half in a bumper year, even though in years preceding and following the road might show results in red ink. The Railway Business Association has inquired whether the recapture provision, so long as it is retained, might not be interpreted to mean average annual income over a period longer than one year. In support of this suggestion, we cite another paragraph of the section, where Congress goes out of its way to authorize the Commission, previously in possession of full power over accounting, to make "reasonable" regulations for the computation of recapturable income. If this could be done, the practical effect would be to sanction the charging of maintenance as an operating expense to the year in which it is earned whilst spending it in another year. In the depreciation accounting case just decided, the Commission invites fuller discussion of this aspect before expressing an opinion.

Stabilizing Industrial Labor

In the effort to stabilize national prosperity, stability of railway purchases has a twin sister—stability of industrial labor. When general industry and commerce are steady, so is consumption by individuals, so is traffic, so is railway revenue, so is employment of labor upon the railroads—not only the two-thirds who are engaged in departments other than maintenance of equipment, but the one-third employed in the shops. It would be a great boon to railway labor, to railway management, to railway owners, to those engaged in any way in the railway supply business and to miscellaneous industries and trade throughout the communities everywhere, if something could be done to increase the stability of the labor which is engaged in the manufacture, reconstruction and repair of locomotives and cars. Where can this work be performed under conditions best calculated to increase stability of employment?

In the railroad shops? No. When any railroad suffers a considerable decline in revenue, it cuts all work to the bone, laying off as many men as it can. Its own requirements reduced, it cannot put its men at work for another railroad or for non-railroad customers. It exhibits the maximum degree of liability to periodical unemployment among the shop employees. The more of them it has, the greater the lay-off. Meanwhile its interest charges on facilities provided for performing its own manufacture goes on unabated.

In the contract shops? Obviously; for, when such a concern faces a stoppage of orders from one railroad, it may still hold its men doing work for other railroads, and, when all its railroad orders cease, it may still postpone or mitigate the labor lay-off through greater activity in lines which it sells to general industry.

Why Expect Good Business?

What is it leads some railway manufacturers to expect indefinite continuance of good general business in this country, with only moderate recessions, if any? I suspect that it is one of those consensuses of opinion which are diffused when, day after day, specialists report current news of activity each in his field with an absence of disturbing manifestation.

Looking at railway purchases taken by themselves, one phase is undoubtedly the transitory nature of inventory readjustment. Many roads lived for a time and many are still living, so far as supplies are concerned, largely on their fat. Everyone has looked forward to completion of this process in the elimination of what General Lord calls "non-recurrent" resources.

Nor can economy in use of equipment, such as has been attained through railroad efficiency and shippers' co-operation, be counted on for indefinite postponement of additions and betterments. Roy V. Wright thinks the slack in both these directions has already been taken up. A coal car shortage was actual this fall and for all kinds of freight cars in good order the surplus sank to 79,000—a narrow margin, in the light of more experiences than one. In any event, the carriers are vigorously on the job of getting ready for peaks in 1927 and years following, nobody knows how high.

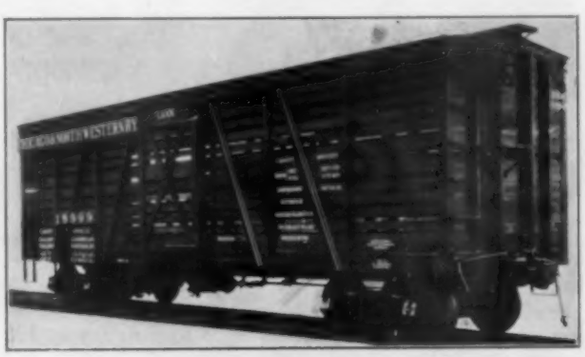
General business, upon which railway traffic and railway supply activity depend, is presenting some of the aspects which characterized the halcyon thirteen years from 1893 to 1907. In 1893, as in 1923, a peak in freight ton-miles was followed by a substantial slump, and thereafter, without any considerable recession recovery and advance, continued until 1907, when ton-miles had scored, peak to peak, an increase of no less than 153 per cent. In commercial failures the figures after 1897 were nothing like as favorable as since 1923. Following the great smash in 1893 there were violent ups and downs in the total liabilities of liquidated concerns until 1899. If railroad traffic could go on advancing, as it did under these conditions, what are we to expect now, with total liabilities in commercial failures annually declining and in 1926 almost sensationally descending in each of the quarters so far reported. A factor of first importance affecting the bankruptcy trend, present after 1893 and which just now is more prevalent than for many years previously, is industrial consolidations. High-cost concerns are being deflated and absorbed before they reach the stage of collapse, of default and of the spread of loss among creditors, and their creditors, and theirs.

Wearing Out Railroad Equipment

George Burnham, my senior partner in the firm of Burnham, Williams & Co., predecessors of the now incorporated Baldwin Locomotive Works, used to say: "Every locomotive in service is a promissory note advancing to maturity. It is renewed as long as possible by general repairs and finally retired by amortization."

Still, in mid-December, the transportation machine is hard at work wearing out railway rolling stock, road and structures for the supply industry to replace, rebuild and modernize, still depleting stores for supply dealers to replenish. Shippers, as late as the week ended December 11, loaded freight cars to a total of nearly a 1,000,000.

This mid-winter destruction of locomotives, cars, track and other property is piled upon an obstinate series of weekly scores never dropping below 1,000,000 and reaching, in October, a new peak of 1,216,432 for one week and a new weekly average of 1,201,204 for one month. Battering away at the carriers' facilities and draining off their inventories, the farmers, lumbermen, miners, manufacturers and merchants of America, including importers never so busy, are making steady work at good wages for about 2,000,000 men in the works where railway necessities are assembled, in the factories where material and parts are fabricated, and in the mills where tools, furniture and supplies are produced for all these others. In communities throughout all the states these millions of makers of railway requisites are pouring out their payrolls to "the butcher, the baker, the candlestick maker," "doctor, lawyer, merchant." All these fortunates are buying food, clothes, shelter, house furniture and luxuries which, from raw material to retail stores, heap yet more tons of traffic on the railways, wearing out yet more facilities for the railway supply industry to replace: harbingers of still greater traffic to come, for which there must result demands for maintenance, additions and betterments, sufficient to restore the abstention from purchases during recent years.



Single-Deck Stock Car Built by the Illinois Car & Manufacturing Company for the Chicago & Northwestern

The Reballasting of Tracks on the D. & R. G. W. is Typical of Much Work in Prospect for 1927

Liberal Expenditures for Improvements Forecasted for 1927

Budgets of 27 representative roads indicate that total outlay for new facilities will approximate $750,000,000 to $900,000,000

By Elmer T. Howson
Western Editor, *Railway Age*

THE railways of the United States and Canada will probably spend somewhere between $750,000,000 and $900,000,000 of new capital for equipment and other additions and improvements to their properties, exclusive of current repairs and maintenance, in 1927. The above sentence is a duplication, except as to date, of the opening sentence in the review of the improvement program in prospect a year ago. It indicates that the present outlook is for a continuation during the year now opening of the liberal program of expenditures which characterized the policy of the railway managements during 1926 and which has prevailed since 1922. This conclusion is based on studies of the traffic now being handled and in prospect, statements of railway and industrial executives in letters to the *Railway Age*, and the budgets furnished us by 27 representative roads with an aggregate of nearly 90,000 miles of lines, checked by comparisons with similar information furnished us by the roads during each of the last four years and with the amounts actually spent for these purposes during these years.

The continuation of an improvement program on this large scale is particularly significant because of the fact that during 1926 the railways handled the heaviest traffic in their history without congestion or shortage of facilities at any time. Since the adequacy of facilities is measured more directly by the number of cars handled than of tons hauled, the excellence of last year's performance may be shown by the fact that the total number of cars loaded during the first 49 weeks of 1926 was 51,586,479 as compared with 49,533,391 in 1925. The magnitude of the expenditures in prospect for 1927 testifies also to the intention of the managements as a whole to keep their facilities abreast of and ahead of such demands of their traffic as may normally be expected.

From the standpoint of improvement programs, the Canadian railways stand out in marked contrast with those in the United States for they are in large measure marking time and holding expenditures within narrow limits. This is due in part to the uncertainty regarding the ultimate outcome of the Canadian government's experiment in railway operation. It is also due in part to the over-development of railways in western Canada immediately prior to the world war and the stationary or receding population in the prairie provinces since that date.

In analyzing the data contained in this article, it should be borne in mind that it does not purport to be a complete statement of the expenditures that the railways will make during 1927. The extent to which the managements feel warranted or required to undertake the enlargement of their facilities depends to a large degree on the amount of traffic actually moving and in immediate prospect throughout the year. This is especially true of orders for cars and locomotives, which commonly fluctuate quite directly with traffic. In view of the limited purchases of equipment during the last two years, however, and the fact that during the peak business of

last October the car surplus was reduced to one-third of a single day's requirements for loadings, it may be expected that the orders for equipment will be larger than the budget figures given below indicate. This view is further supported by the renewed activity in equipment buying that started late in 1926.

In this article the purpose is to present conservatively the improvements which the roads are now planning with sufficient definiteness to include them in their budgets and to set aside the necessary funds therefor. Many of the roads have not yet determined what capital expenditures they will make during 1927. The information that we have received indicates that the railways as a whole are behind the schedules of recent years in the completion of their programs for their improvement work. Furthermore, the programs that are summarized in the data which follow may be altered materially with changes in business conditions which may develop during the year. It is believed, however, that a survey of those budgets which have been completed offers an indication of the attitude of the managements of the railways towards the future and a measure of their belief in the necessity for the amplification of their facilities to afford increased capacity and for the improvement of their facilities to provide economies in operation.

The Uncertainty of Any Forecast

The *Railway Age* is not unaware of the dangers involved in attempting to forecast the expenditures which a railway may make for as much as a year in advance, for programs of this character are subject to change with little or no warning with fluctuations in busness conditions. Yet with all of their hazards, they are no more uncertain than other business forecasts for fluctuations in railways purchases are dependent on the same fundamental conditions in the business world, and business as a whole is founded largely on forecasts of future trends and on the interpretation of present tendencies.

The attempt to forecast the probable magnitude and character of the expenditures contemplated by the railways was first made by the *Railway Age* for 1923 and published in its annual statistical issue of January 6 of that year. At that time it was estimated that more than $700,000,000 would be spent by the roads in the United States and Canada in the next 12 months. The magnitude of this estimate is indicated by the fact that the average net increase in investment in road and equipment by the railways of the United States during the ten years preceding had been less than $500,000,000. Yet the traffic increased to such a point and the demand for facilities became so pressing during that year that the Class I railways of the United States alone spent $1,059,149,000 of new money.

On January 5, 1924, we again estimated that the railways of the United States and Canada would spend $1,200,000,000 during that year, in comparison with which data compiled by the Bureau of Railway Economics showed that the Class I railways of the United States alone spent $874,743,000. When the expenditures made by the railways in Canada and by other than Class I railways of the United States were included, the total approximated $1,000,000,000.

A year later in the annual statistical issue of January 3, 1925, it was estimated that the railways of the United States would spend $1,350,000,000 for additions and improvements to their property during 1925. In that year the Class I railways of the United States alone authorized $1,200,000,000 in capital expenditures, although the total amount spent fell far short of these appropriations and of our estimate, due largely to an unexpected decline in orders for equipment for delivery during that year. The total expenditures made by the Class I railways during 1925, as compiled by the Bureau of Railway Economics, were $748,191,000, while the expenditures of all of the roads in the United States and Canada probably approached $900,000,000.

A year ago, in the *Railway Age* of January 2, 1926, we estimated that the railways of the United States and Canada would spend between $750,000,000 and $900,000,000 during the year. Data compiled by the Bureau of Railway Economics during the closing weeks of the year as a result of a special inquiry indicated that the expenditures of the Class I roads of the United States would approximate $875,000,000, the figures for the last three months being estimated. With the amounts spent by other lines, it is evident that the total expendiures for all roads, including those of Canada, again approximated $1,000,000,000 last year.

The Budgets on Which Our Estimates Are Based

In arriving at our estimate of the volume of expenditures that will be made for enlarged and improved facilities during 1927, we were aided by summaries of the budgets furnished us by 27 roads with an aggregate mileage of 82,500, including the following:

Baltimore & Ohio
Buffalo, Rochester & Pittsburgh
Central Railroad of New Jersey
Chesapeake & Ohio
Chicago & North Western
Chicago, Burlington & Quincy
Chicago Great Western
Chicago, Indianapolis & Louisville
Chicago, Rock Island & Pacific
Delaware & Hudson
Delaware, Lackawanna & Western
Denver & Rio Grande Western
Detroit, Toledo & Ironton
Elgin, Joliet & Eastern
Florida East Coast
Great Northern
Gulf, Mobile & Northern
Lehigh Valley
Maine Central
Minneapolis, St. Paul & Sault Ste. Marie
Nashville, Chattanooga & St. Louis
New York, New Haven & Hartford
Norfolk & Western
Reading
St. Louis-San Francisco
Southern Pacific
Western Maryland

A study of the budgets of these 27 roads shows that they plan to undertake additions and betterment work during the current year involving an expenditure of more than $315,000,000. If other roads spend at the same rate, the appropriations of the railways in the United States alone will approximate $900,000,000. However, as a part of the railway mileage of the country is made up of short lines which normally make relatively smaller expenditures for improvements, a more conservative estimate will place the total volume of expenditures during 1927, including the Canadian roads, at somewhere between $750,000,000 and $900,000,000.

A measure of the magnitude of these expenditures is afforded by the following comparison with the capital expenditures made by the Class I railways of the United States during the last seven years, compiled by the Bureau of Railway Economics.

Capital Expenditures—Class I Roads Only

1920	$653,267,000
1921	557,035,000
1922	429,273,000
1923	1,059,149,000
1924	874,743,000
1925	748,191,000
1926 (estimate)	875,000,000
1927 (our estimate)	$750,000,000 — 900,000,000

The Attitude of Railway Executives

Letters received by the *Railway Age* from the executive officers of many of the leading railways support our forecast regarding the continuation of expenditures for

improvements during 1927 on an equal or more liberal scale than has prevailed during the past year.

E. J. Pearson, president of the New York, New Haven & Hartford, suggests the thought that "transportation is commencing to be crowded," indicating his belief in the need for larger capital expenditures. James E. Gorman, president of the Chicago, Rock Island & Pacific, advises that this road is giving consideration to one of the largest improvement budgets ever presented. J. M. Davis, president of the Delaware, Lackawanna & Western, expresses the thought that it is "necessary for the railways to invest capital in the future for improvements and expansion on even a larger scale than in the past, particularly to keep down the cost of producing transportation." E. E. Loomis, president of the Lehigh Valley, shares the same thought in his statement that there is every reason for expecting that the railways must continue to build up their plants on the present or an even greater scale. J. S. Pyeatt, president of the Denver & Rio Grande Western, states that it "will be necessary to continue to invest capital for improvements and expansion on at least as large a scale as within recent years." L. A. Downs, president of the Illinois Central, after commenting on the thought that expenditures are governed by traffic requirements, states that "in my opinion there is nothing more certain than that railway traffic shall continue to grow."

Numerous other railway executives believe that the railways should continue to spend about as much as they have in recent years. Among these, W. B. Storey, president of the Atchison, Topeka & Santa Fe, states that "the railways ought to spend about as much for capital purposes as the average of the last four years." Charles Donnelly, president of the Northern Pacific, expressed the same view as P. E. Crowley, president of the New York Central, who states that "expenditures for materials, equipment and supplies should be normal," while W. R. Cole, president of the Louisville & Nashville, states that "improvements so far contemplated or authorized are substantially the same in character and amount as for 1926."

On the other hand, J. R. Kenly, president of the Atlantic Coast Line, a road that has been making unusually large expenditures for increased facilities during recent years, states that the capital expenditures on this line will probably be less than in 1926, while C. T. Jaffray, president of the Minneapolis, St. Paul & Sault Ste. Marie, does not believe that "any investment in improvements or expansion will be necessary."

Large Appropriations Are Also Carried Over

In addition to the appropriations for new expenditures which have been referred to above, 29 roads with an aggregate mileage of 100,000 have reported to us that $90,000,000 of unexpended appropriations will be carried over into 1927. On this basis the total amount carried over by all of the roads will exceed $250,000,000.

This is a normal condition, for many projects are of such magnitude that they cannot be completed within a single year, while other expenditures are authorized so late in the year that they must, of necessity, be carried over to completion in the following year. Thus, compilations of the Bureau of Railway Economics show that unexpended appropriations, largely for equipment ordered late in the year, were carried over from 1925 aggregating $475,000,000. In addition new work involving the expenditure of $700,000,000 had been authorized between January 1 and October 1, 1926, bringing the total amount approved for expenditure to $1,175,000,000. Of this, $629,000,000 had been expended to October 1, while it was estimated that the total amount expended during the year would rise to $875,000,000. This leaves $300,000,000 of appropriations authorized prior to October 1 to be carried over into 1927, in addition to other appropriations authorized since that date which, in view of the recent orders for equipment, will probably bring the total up to more than $450,000,000.

The total sum available for expenditures this year, including new appropriations which have already been estimated at $750,000,000 to $900,000,000 will therefore be between $1,150,000,000 and $1,300,000,000. It is not to be expected, however, that all of this money will be spent next year and it is safe to assume that the carry over from 1927 into 1928 will approximate that carried over into the year now opening. The effect is, therefore, to eliminate the amount carried over as a consideration in estimating the expenditures to be made in 1927.

Among the roads carrying large amounts over from 1926 are the New York Central System, $30,000,000; the Louisville & Nashville, $19,760,000; the Norfolk & Western, $9,000,000; the Southern Pacific, $7,100,000; the Reading, $6,164,900; the Florida East Coast, $3,200,000; and the Chicago, Burlington & Quincy, $3,000,000.

Among specific projects reported as carried over for completion during 1927 are extensions of the Atlantic Coast Line from Imokalee, Fla., to Deep Lake and from Thonotosassa to Richland, and of its subsidiary, the Ft. Myers Southern, from Naples to Marco; the new line of the Illinois Central between Edgewood, Ill., and Fulton, Ky., which involves a total expenditure of nearly $20,000,000; grade separation at Perth Amboy, N. J., and Somerville on the Central Railroad of New Jersey; the tunnel through the Cascade mountains on the Great Northern; the construction of a large mileage of second tracks and automatic signals on the Louisville & Nashville; the completion of large classification yards at Williamson, W. Va., and Portsmouth, Ohio, on the Norfolk & Western; and the completion of a grain elevator at Port Richmond (Philadelphia) and shops at Reading, Pa., by the Reading.

Budgets of Many Roads Not Available

In the preparation of our estimates, we faced the fact that the budgets of many roads are not available. For one reason, a number of large roads, including the New York Central and the Louisville & Nashville, do not prepare budgets but authorize work as the need arises at any time throughout the year. For such roads, it is possible, therefore, to include in our estimates only the unexpended portions of those appropriations which have already been made and are carried over into 1927. Another reason for the incompleteness of our survey is the increased tendency to delay the completion of the budgets which was noted last year, but which is still more pronounced this year.

This condition is induced in part by the lack of necessity for the early ordering of materials in order to secure delivery in time for use in the spring and also in part by the lack of pressing need for facilities, induced by the demonstration last fall of the ability of the roads to meet all demands for service with their present equipment. For these or other reasons, budgets have not yet been completed on the Atchison, Topeka & Santa Fe, the Canadian National, the Delaware & Hudson, the Chicago & Eastern Illinois, the Chicago, Burlington & Quincy, the Chicago, Milwaukee & St. Paul, the Illinois Central, the Kansas City Southern, the Missouri-Kansas-Texas, the New York, Chicago & St. Louis, the Northern Pacific, the St. Louis-San Francisco, the Seaboard Air Line and other roads.

Below—Castle Gate, Utah, on the Denver & Rio Grande Western Main Line After Heavy Realinement and Ballasting Program

Above—Rock Cut on the New Black Butte Line of the Southern Pacific

In the Oval—On the Southern Pacific's Natron Cut-off

Above—The Gila River Bridge on the New Arizona Line of the Southern Pacific

At the Left—Old First Main and New Second Track Bridges in the Weber Canyon on the Union Pacific

Outstanding Improvements and New Construction in 1926

The Nature of the Expenditures

The expenditures authorized for 1927 as well as those carried over from 1926 will go for the many facilities which in the aggregate comprise a railway. They are divided into two primary groups: (1) equipment, consisting primarily of cars and locomotives, and (2) roadway and structures or fixed properties.

Of the $315,000,000 included in the budgets sent us approximately $98,000,000 was reported as going for equipment and $217,000,000 for roadway and structures. In other words, of these appropriations approximately 30 per cent is scheduled for equipment and 70 per cent for roadway. This indicates a continuation of the tendency of recent years to devote an increasing proportion of the total expenditures to those facilities which promote the more intensive use of equipment and a smaller proportion to equipment itself. This trend is shown by the following comparisons for recent years.

Year	Total capital Ex- expenditures	Expenditures for equipment	Per cent of total	Ex- penditures for roadway	Per cent of total
1923	$1,059,149,426	$681,723,991	64	$377,425,435	36
1924	874,743,228	493,608,460	56	381,134,768	44
1925	748,191,000	338,114,000	45	410,077,000	55
1926	875,000,000	380,000,000	43	495,000,000	57

This trend is not unexpected or unusual for it merely indicates a return to the more nearly normal pre-war ratio when approximately one-third of the capital expenditures went for equipment and two-thirds for fixed properties. It is also an indication of the fact that the roads consider that the wartime depletion of cars and locomotives has been made good, the best corroborative evidence for this conclusion being the performance of the past year. From the standpoint of the equipment builders, however, the prospects are not as pessimistic as this ratio indicates because of the fact that the greatest swell in appropriations during the year commonly comes in equipment which is ordered without advance notice as the need arises. For obvious reasons many roads are inclined to withhold information regarding their decision to purchase equipment until actually ready to enter the market.

Thus, while information furnished us by the roads a year ago indicated that 65 per cent of the appropriations for 1926 would go for roadway facilities and only 35 per cent for equipment, 43 per cent of the expenditures for the first nine months of last year actually went for equipment. Similarly, it may be expected that at least 40 per cent of the expenditures this year, or from $300,000,000 to $360,000,000, will go for cars and locomotives and their accessories.

Some of the Larger Budgets

Among the roads which have indicated that they are contemplating large programs of expenditures during 1927 (including new appropriations and those carried over from 1926) are the following:

Chesapeake & Ohio	**$55,254,674**
Chicago & North Western	**38,000,000**
Southern Pacific	**37,100,000**
New York Central	**30,557,000**
Norfolk & Western	**23,315,000**
Chicago, Burlington & Quincy	**23,000,000**
St. Louis-San Francisco	**21,622,089**
Louisville & Nashville	**19,760,000**
Great Northern	**17,500,000**
Delaware, Lackawanna & Western	**14,845,000**
Reading	**13,254,739**

The year which has just closed saw more new mileage built than in any year in the last decade. The information that we have received indicates that construction of this character will be continued at an accelerated rate this year, for the 27 roads whose budgets we have received have authorized the expenditure of more than $32,000,000 for the construction of 725 miles of lines. This indicates that the roads as a whole will spend more than $75,000,000 next year and will again complete more than 1,000 miles of lines.

More New Lines Will Be Built

Among the larger appropriations of this character are those of the St. Louis-San Francisco for $9,300,000 for the construction of a connection between its line near Birmingham, Ala., and the Muscle Shoals, Birmingham and Pensacola line which it recently acquired. Another large project is that of the Chicago, Burlington & Quincy which through its subsidiary, the Colorado & Southern, was granted permission by the Interstate Commerce Commission late last year to build 200 miles of lines in western Texas which are estimated to cost $6,000,000. The Chesapeake & Ohio contemplates the construction of three branch lines involving heavy construction with an aggregate length of 79 miles for which it has set aside $13,000,000, while the Great Northern expects to extend a branch for a distance of 33 miles in Montana at a cost of $1,000,000. The Southern Pacific has appropriated $1,400,000 for the construction of two lines with a combined length of 27 miles, while the Reading has appropriated $837,000 for 5 miles of extensions; the Denver & Rio Grande Western $500,000 for an 11-mile extension in Colorado; and the Detroit, Toledo & Ironton and its subsidiary, the Detroit & Ironton, $245,000 for new construction in Ohio.

Increased Activity in Second Main Track Construction Indicated

In contrast with the tendency which was evident last year to secure increased track capacity by other means than second track, the budgets this year indicate considerably renewed interest in this form of construction, for the indications are that more than $50,000,000 will be spent for the construction of over 600 miles of second and other multiple main tracks. Among the larger projects of this character of which we have been advised are those of the Chesapeake & Ohio which has set aside $5,583,000 for the construction of 45 miles of track; the Southern Pacific which has appropriated $3,300,000 for 52 miles of second track; the Delaware, Lackawanna & Western where $3,000,000 has been appropriated for the construction of 16 miles of such tracks; the Chicago, Burlington & Quincy which will spend $2,295,000 for 22 miles of second track on its Chicago-Minneapolis line; and the Chicago & North Western which contemplates the construction of 100 miles of second track next year. Other roads with appropriations for additional main tracks in their budgets include the Denver & Rio Grande Western, the Reading and the St. Louis-San Francisco.

$85,000,000 Will Be Spent for Terminal Facilities

The railways are also making more liberal appropriations for new and enlarged freight classification yards as is shown by the fact that while we estimated a year ago that the total expenditures for this purpose would exceed $35,000,000 in 1926, the 27 roads whose budgets we have this year included more than $26,000,000, on which basis the appropriations for 1927 will approach $60,000,000. Among the larger appropriations of this character are those of the Norfolk & Western for $5,500,000 for facilities at four points, while another eastern road plans to spend $3,460,000 for facilities at a like number of points. The Southern Pacific plans to spend $3,000,000 for facilities at 14 points and the

Delaware, Lackawanna & Western the same amount at one point. Other large appropriations for terminal facilities of this character are those of the St. Louis-San Francisco for $1,750,000 at four points; the Minneapolis, St. Paul & Sault Ste. Marie $1,500,000 at two points; the Chicago & North Western $2,000,000 at two points; another western road $1,000,000; and the Detroit, Toledo & Ironton $945,000 at two points.

Our data indicate that approximately $10,000,000 will be spent for passenger stations and more than $15,000,000 for freight stations next year. Among the larger programs of this character are those of the Chicago & North Western which will spend $2,500,000 for freight stations at two points; the Southern Pacific $2,200,000 for passenger stations at 11 points and local freight facilities at 4 points; the Reading, $1,372,000 for passenger facilities at five points and freight facilities at three points; the New York, New Haven & Hartford $1,000,000 for local freight facilities at one point; the Chicago, Burlington & Quincy $950,000 for a passenger station at Lincoln, Neb.; the Delaware, Lackawanna & Western $900,000; another large eastern road $1,525,000 for freight and passenger facilities at eight points; and the Norfolk & Western $630,000 at three points.

Less for Shops and More for Shop Machinery

If the roads whose budgets we have are typical of the railways as a whole they will spend less for shops and more for shop tools in 1927 than was contemplated last year, for on the basis of our information less than $25,000,000 will be spent for shops next year as compared with nearly $40,000,000 contemplated last year, while more than $10,000,000 will be spent for shop equipment, or 50 per cent more than was estimated a year ago. Among the larger budgets for shop facilities are those of the Chesapeake & Ohio which plans to spend $5,800,000 for shops at six points and $200,000 for shop tools and the Southern Pacific which will spend $1,000,000 for shop facilities at 12 points and $400,000 for shop tools.

The Chicago & North Western plans to spend $250,000 for the improvement of its shops and $1,200,000 for tools and equipment, while the New York, New Haven & Hartford plans to spend $600,000 for shops and $200,000 for equipment; the Central Railroad of New Jersey $500,000 for shops and $216,000 for equipment; the Norfolk & Western $300,000 for shops and $400,000 for equipment; the Minneapolis, St. Paul & Sault Ste. Marie $500,000 for shops and $100,000 for equipment; and the Florida East Coast $350,000 for shops and $150,000 for equipment.

Much Signaling in Prospect

With the installation of train control in compliance with two orders of the Interstate Commerce Commission completed or approaching completion, it is to be expected that the railways will give more attention to signaling in 1927. This conclusion is borne out by the budgets furnished us which show that the 27 roads whose data we have contemplate spending $5,400,000 for the construction of more than 1,000 miles of automatic signaling, in addition to a number of interlocking plants. On this basis between $10,000,000 and $15,000,000 will be spent next year for equipment of this character and automatic signaling should be installed on more than 2,000 miles of lines.

Much Money for Other Roadway Facilities

Among other classes of roadway facilities for which increasing demands are being made from year to year are those for the separation of grades within the limits of cities and also in the open country. Nearly $50,000,000 will be spent for this purpose alone if the appropriations of the roads whose budgets we have are indicative of the total. The Central Railroad of New Jersey has appropriated $2,700,000 for this purpose; the Chesapeake & Ohio $2,630,000 and another eastern road $3,189,000; the Norfolk & Western $2,500,000; the Chicago & North Western $1,500,000; the Great Northern $1,250,000; the Delaware, Lackawanna & Western $1,200,000; the Detroit, Toledo & Ironton and the Detroit & Ironton $1,025,000; the Delaware & Hudson $686,000; the Reading $577,000; the Southern Pacific and another western road $500,000 each; and the St. Louis-San Francisco $450,000.

Large inroads are made upon the capital expenditures for roadway facilities by the requirements of ballasting and rail laying. Last year saw much improvement in track construction and the indications are that 1927 will be at least as active. This is indicated by the fact that the roads whose information we have plan to lay 3,723 track miles of new rail in 1927, as compared with 3,650 last year, while they plan to ballast 3,900 miles of track as compared with 3,805 in 1926.

The roads will also spend approximately $100,000,000 for a wide variety of miscellaneous improvements other than equipment, such as new and heavier bridges, modern water stations and water treating plants, elevators, etc. Among items of this character included in the budgets is $9,350,000 for the reconstruction of bridges and $595,000 for passing tracks on the Chesapeake & Ohio; $384,000 for bridges on the Delaware & Hudson; $1,900,000 for the renewal of bridges and $700,000 for water treating plants on another eastern road; $2,600,000 for a bridge over the Hackensack river on the Delaware, Lackawanna & Western; $500,000 for bridges and $100,000 for water facilities on the Denver & Rio Grande Western; $3,000,000 for the continuation of construction of the tunnel through the Cascade mountains and $1,000,000 for the reconstruction of an ore dock on the Great Northern; $100,000 for the rebuilding of bridges on the Maine Central; $510,000 for a tunnel on the Nashville, Chattanooga & St. Louis; $432,000 for the construction of bridges, $557,000 for engine facilities, $250,000 for coal and freight yard facilities and $713,000 for warehouse and storehouse facilities on the Reading; $982,000 for the strengthening of bridges and $102,000 for the construction of water stations on the St. Louis-San Francisco.

Expenditures for Equipment Will Exceed $300,000,000

As stated previously, the indications are that the railways will spend between $300,000,000 and $360,000,000 for equipment this year. The plans of many of the roads are, of necessity, incomplete with reference to the number of cars and locomotives for which they will enter the market. The information that they have given us is confined, therefore, largely to the requirements for which they have contracted recently but on which deliveries have not yet been made, supplemented by those additional requirements for which they have indicated that they will enter the market in the very near future.

Among the larger appropriations for freight cars are those of the Chesapeake & Ohio of $5,906,000 for 2,953 cars; the Chicago & North Western of $5,400,000 for 3,000 cars; the Norfolk & Western of $5,250,000 for 2,275 cars; the Southern Pacific of $4,500,000 for 2,014 cars; the Great Northern of $3,500,000 for 1,400 cars; the Delaware, Lackawanna & Western of $2,500,000 for 1,000 cars; and the St. Louis-San Francisco $1,156,000 for 625 cars.

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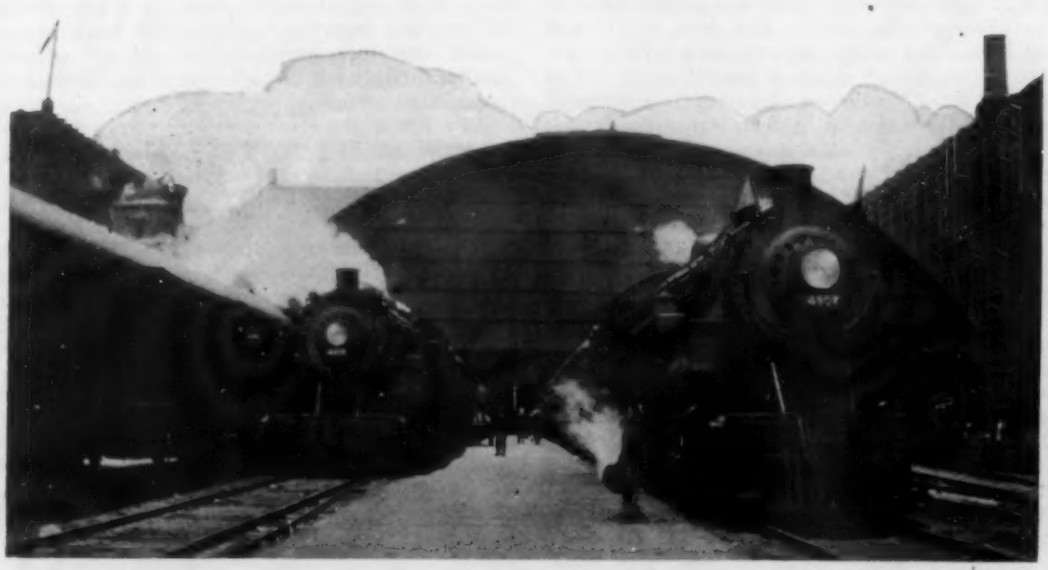

A Review of Railway Operations in 1926

Progressive improvement in efficiency of operation shown by statistics

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RAILWAY operations during the past year exhibited two striking characteristics.

In the first place, the freight traffic offered to and handled by the railways faithfully reflected the industrial and commercial activity of the country. As that activity reached a high level, so did railway traffic rise to a higher and more sustained level than ever before.

Again, railway performance showed the same trend toward greater efficiency that had been exhibited to a marked degree in 1925, and to a lesser extent in the years 1923 and 1924. This progressive improvement in efficient operation resulted from the collective campaign of railways and shippers to place railway performance on a substantially higher and relatively permanent basis.

Railway achievement during the past four years can be attributed to the conscious development of a program of co-operative effort. To a greater degree, the same comment applies to the results for 1926. Those results proved even more successful and satisfactory in 1926 than they did in the earlier years. It may again be emphasized that the efficient operation of 1926 was not the outcome of chance, but was the effect of the gradual unfolding of a definite program, by which the railways since the beginning of 1923 have invested more than three and a half billions of dollars of new capital in their properties, have secured a fine degree of co-operation from shippers and the general public through the extension of the shippers' advisory board movement, and have developed a fine spirit of loyalty on the part of railway employees.

The first shippers' advisory board was organized early in 1923, at Minneapolis. Since that date, the United States has been divided into regions, each with its advisory board functioning from a central point. The fourteenth and final board was organized at Pittsburgh last November. As indicated by their name, the boards are composed principally of shippers, and their functions are advisory. Frequent meetings and conferences, supplemented by the work of committees dealing with specific commodities, have brought about a closer relationship between railway managements and shippers, have ironed out and prevented transportation difficulties, and have aided the railways to anticipate and prepare for future transportation demands.

The aggregate membership of the fourteen boards is approximately 15,000, who are believed to represent 25 million users of transportation. The wholesome effect of the intelligent co-operation of these representative groups of shippers with the railways, in the furtherance of improved service, can hardly be measured. As a movement toward a common understanding and effort, these organizations have succeeded far beyond the hopes of their original sponsors.

This success has received widespread recognition. The Interstate Commerce Commission referred to the movement in its last two annual reports, stating its belief that "the principle of co-operation and mutual understanding is sound." Secretary Hoover's recent annual report characterizes it as "a fine example of co-operation between industries and trades," and credits it with a definite contribution to improvement in railway service. Endorsement has been given by representative leaders in all walks of our economic life.

Among other things, the boards helped to carry out two definite local programs during 1926: a clearing up of the traffic congestion in Florida early in the year, and the institution of the so-called "grape car plan" in California, later in the year. Both program were of great benefit to the shipping communities of the respective states.

Whatever has caused the improvement in railway efficiency, the most significant feature of that improvement is its effect on the economic welfare of the United States. On this point, testimony is emphatic from all sources. Some of this testimony will be presented at a later point.

Adequate, prompt, and dependable transportation service has speeded up industrial processes everywhere. It has enabled manufacturers to operate with smaller stocks, on more definite schedules, and in the confidence that their materials will come in and go out as and when promised. It has enabled merchants to work on a lower margin of inventories. All this has meant a reduction in credit demands, partial release of "frozen assets," saving in interest charges, and corresponding benefit to the whole economic structure, from producer through distributor and financing agent to the final consumer.

The economic contribution to national welfare cannot be appraised, but it is no less real and definite although not calculable.

As a result, the economic place of the railways in our industrial life is today recognized and appreciated as probably never before in our history.

General Summary of 1926

In brief, railway operations in 1926 can be summarized as follows:

1. Record breaking freight traffic, which continued throughout almost the whole of the year at a high level.
2. Passenger traffic that nearly held its own with 1925, falling less than one per cent below 1925. With one exception, however, the passenger business was below that of any year since 1916.
3. Satisfactory condition of transportation service, there being only a few and local instances of congestion or accumulation, and an almost complete absence of car shortage.
4. Condition of virtually maximum performance in

many of the factors of operation, and a high level of attainment in all other factors.

5. Total operating revenues greater than in any previous year.

6. Total operating expenses greater than in any previous year except 1920.

7. Further reduction of the operating ratio, bringing it down to 72.7 per cent for 1926, and lower than in any year since 1917.

8. Total railway taxes that for the first time surpassed $400,000,000.

9. Net railway operating income greater than in 1925 by about ten per cent, and greater than in the previous peak year of 1916. The rate of return on property investment for the year was approximately 5.2 per cent, which was less than in 1916. Because of rapid growth in railway capital during recent years, the improvement in rate of return has been much slower than that of aggregate net income.

Railway Traffic in 1926

The freight traffic of the railways of the United States in 1926 was the greatest ever recorded. If the traffic be measured in terms of revenue carloadings, the increase over 1925 was four per cent, and over 1923, the next greatest peak year, was nearly seven per cent. In net ton-miles, which includes non-revenue freight, the year 1926 also broke all previous records, being seven per cent greater than in 1925 and six and a half per cent greater than in 1923.

The passenger miles were six-tenths of one per cent less than in 1925, and by a greater margin were less than that of 1924, 1923 or 1920. In fact, the almost constant recession in passenger business since 1920 has resulted in a cumulative decline amounting to more than 25 per cent during the past six years.

Table I is the basic table from which these comparisons have been taken. The revenue carloading figures are the sum of the tabulations made each week by the Car Service Division of the American Railway Association.

Net ton-miles are reported by the railways monthly to the Interstate Commerce Commission, and include both revenue and non-revenue movement. The passenger-miles are also based upon the monthly reports of the carriers to the Commission, and include revenue movement only.

The entries for 1926 in the table are partially estimated, and will be subject to revision when the final returns for the year become available. This is true of all subsequent tables, as well as charts, in which returns for the whole of the year 1926 are presented. All the statistics in this article pertain to railways of Class I, unless otherwise noted.

The comparison in Table I is of the traffic results for the year 1926 with those for 1925, 1923, 1920, and the five-year average from 1921 to 1925. The years 1920 and 1923 have been included, along with 1925 and the five-year average, because they were both peak years in freight traffic, and thus present a significant basis of comparison for the new peak reached in 1926.

Table I—Comparative Traffic Results

Revenue Carloadings		
	1926	53,260,000
	1925	51,320,000
5-year av.	1921–1925	46,405,000
	1923	49,812,000
	1920	45,118,000
Net Ton-Miles		
	1926	488,000,000,000
	1925	456,265,000,000
5-year av.	1921–1925	412,876,000,000
	1923	457,607,000,000
	1920	449,125,000,000
Passenger-Miles		
	1926	35,750,000,000
	1925	35,964,000,000
5-year av.	1921–1925	36,590,000,000
	1923	38,008,000,000
	1920	46,848,000,000

Perhaps the most interesting feature of Table I is the item of aggregate carloadings for 1926. This estimate of 53,260,000 cars represented for the first time a weekly average of a million cars or more, extending over a period of one calendar year. This feature is so striking that the next section is devoted to a brief story of the gradual climb of the railway freight service to a basis of a million cars per week.

Trend of Freight-car Loadings

One index of the trend of railway freight traffic is found in the weekly statistics of cars loaded with revenue freight, compiled by the Car Service Division.

These statistics are now available since the beginning of the year 1918. During the nine-year period from 1918 to 1926, inclusive, the carloadings have shown, with some recessions, a generally upward tendency.

The average weekly loadings for each year of this nine-year period have been as follows:

1918	857,000	1923	958,000
1919	804,000	1924	933,000
1920	868,000	1925	987,000
1921	756,000	1926	1,024,000
1922	831,000		

The increase from a weekly average of 857,000 in 1918 to more than a million in 1926, represents a rise of 19.5 per cent in eight years, or an arithmetical average increase of 2½ per cent per year.

The story becomes more striking when considered in terms of the performance during individual weeks and months.

Prior to the year 1920, the freight loadings never reached a million cars in any single week. In 1920 there were five million-car weeks, three of which fell in the month of October. No million-car weeks occurred during the years 1921 or 1922. In 1923 there were 21; the first million-car week of that year was reported in May, whereas the first such week in 1920 had not occurred until August.

In 1924 the number of million-car weeks reported fell to 11, every week in October and all but the Labor Day week in September being of that class.

The first week in 1925 to report a million cars was in July. From the middle of July until the middle of December, million-car weeks were the rule, except for the two holiday weeks of Labor Day and Thanksgiving Day. There were 20 such weeks in all.

In 1926 the first million-car week was reported in the middle of May, one week earlier than in 1923. With only three exceptions, being those for the Memorial Day, Fourth of July, and Thanksgiving holidays, every week from the middle of May to the middle of December showed a million cars or over. Even the week of the Labor Day holiday, which had never before failed to drop below a million, reported in 1926 a margin of more than 31,000 cars above that figure.

The total number of million-car weeks in 1926 was 27, representing more than one-half the weeks of the year.

Considered in terms of monthly averages, no individual month prior to 1923 reported a weekly average as much as a million cars. The months of August, September, and October, 1923, surpassed that average. In 1924, September and October showed a similar average, and in 1925 the months of August, September, October and November.

During seven months in 1926, from May to November, inclusive, an average of more than a million cars per

week was attained, while the three months of August, September and October reported an average of more than 1,100,000 cars, and the month of October alone more than 1,200,000.

As to individual weeks, successive peaks have been recorded from time to time during the past nine years, beginning with a peak of 991,980 cars in 1918, and ending with a much higher peak of 1,216,432 cars in 1926.

The maximum loadings successively reported during this nine-year period, with the week in which each one occurred, are as follows:

	Cars loaded
September 20, 1918	991,980
September 20, 1919	995,901
October 11, 1920	1,018,539
September 27, 1923	1,097,493
October 25, 1924	1,113,053
August 29, 1925	1,124,438
November 1, 1926	1,216,432

Not only was a new peak of weekly loadings reached in 1926, but the highest previous monthly and yearly totals were also surpassed. In fact, the previous high level for any single week, which had been reached in 1925, was exceeded in ten different weeks during the year 1926.

Growth of Freight Ton-miles

In terms of ton-miles, as well as carloadings, all records for railway freight service were broken in 1926. The estimated total of 488 billion net ton-miles for the year was greater by 32 billions, or seven per cent, than in 1925. The previous peak had been reached in 1923, but this was surpassed in 1926 by 6.6 per cent.

The difference between carloadings and ton-miles, in respect to the rate of increase for 1926, held generally throughout the year. In January, carloadings actually declined under the corresponding month of 1925, whereas ton-miles showed a small increase. Every other month reported increases for both factors of freight movement, with the rate of increase in ton-miles always greater than that of carloadings. The explanation of this difference seems to lie in the larger proportion of coal movement in 1926 than in 1925, and the slightly smaller proportion of miscellaneous and merchandise freight in the total.

In connection with statistics of ton-miles, it is of interest to note how the freight traffic of the railways has grown from one peak to another during the past thirty years. While there have been recessions in individual years, no peak has ever fallen below the next previous peak year. The term "peak," as here used, denotes the traffic of a year following a period of continuous increase and succeeded by a recession. It happens that no peak year of freight traffic, so defined, but shows an increase over the next preceding peak.

Going back from 1926 to 1896, a thirty-year period, we find the first peak in 1896. The next peak did not come for eleven years, or until 1907, the ton-mile aggregate in the latter year being nearly 150 per cent greater than in 1896. Since 1907, the peaks have come at much more frequent intervals. One occurred in 1910, and reached a point 7.8 per cent greater than in 1907. The next peak, in 1913, was 18.3 per cent greater than 1910. The next following peak was reached in the war year 1918, and was 35.5 per cent greater than in 1913. Since 1918 there have been three peaks in rapid succession, one in 1920, 1.2 per cent higher than 1918; the next in 1923, 0.6 per cent higher than 1920; and the final one in 1926, 7.4 per cent higher than in 1923. While I have called 1926 a peak, it will not in fact prove to be one, if the results for 1927 prove greater. But for the time being it does represent a peak.

The figures just discussed have been in terms of revenue ton-miles for all railways, as statistics for non-revenue ton-miles are not available for earlier years. But the trend, which is here the important element under consideration, would not vary greatly on either basis of comparison.

Table II shows briefly the peak years of ton-mile traffic from 1896 to 1926, a period of three decades of growth in railway development and service.

Table II—Peak Years of Freight Traffic, 1896 to 1926
(Revenue ton-miles, all railways)

Year	Revenue ton-miles (billions)	Per cent increase over preceding peak
1896	95.3	....
1907	236.6	148.2
1910	255.0	7.8
1913	301.7	18.3
1918	408.8	35.5
1920	413.7	1.2
1923	416.3	0.6
1926	447.1	7.4

That each successive peak since 1896 has been higher than the next preceding one, by percentages running all the way from a fraction of one per cent up to nearly 150 per cent, indicates the steady and continuous growth of the United States, the progress of its industrial activity, and the extent to which the railways have kept pace in meeting the demand for transportation.

The complete story in graphic form is presented in Chart *A*, which commences with the year 1894, so as to show the gradual rise to a peak in 1896. From that first peak year in this period, the chart carries the story year by year to the latest high point in 1926.

Monthly statistics of ton-mile traffic have been compiled regularly since the beginning of 1917. As in the case of carloading statistics, the net ton-miles have shown an upward trend from peak to peak. This is indicated in the following brief table, which presents the peak traffic reported in May, 1917, and follows the successive monthly maxima down to October, 1926. The high points in 1917 and 1918 were affected by war activity. The August peak of 1920 was influenced by the knowledge of an impending freight rate increase on August 26. The later peaks have all occurred in October, which is normally the maximum month of the year in freight traffic. The figures follow:

	Net ton-miles		Net ton-miles
May, 1917.....	38,552,000,000	October, 1924.....	43,134,000,000
August, 1918.....	40,776,000,000	October, 1925.....	44,062,000,000
August, 1920.....	42,734,000,000	October, 1926.....	48,273,000,000

Charts *B* and *C* show by months the freight traffic of the year 1926, compared with the five-year average from 1921 to 1925. Chart *B* deals with carloadings, and Chart *C* with net ton-miles. Both charts show marked increases in the freight traffic of 1926, when contrasted with the preceding five years.

Loadings According to Commodities

Table III indicates the distribution of the carloadings of 1926 as between the eight groups or classes into which the Car Service Division divides them. The percentage distribution is also given.

For purposes of comparison, corresponding percentages for 1924 and 1925 are also included in the table.

The greater proportion of coal and coke loadings in 1926 than in 1924 or 1925 stands out as the significant feature of this table. Less marked changes are the reduced percentages in 1926 for grain, live stock, forest products and merchandise. The miscellaneous group of manufactured products, comprising more than one-third of the total loadings, fell relatively below 1925, although its proportion in the total was a shade above that for 1924.

Table III—Percentage Distribution of Commodity Car-loadings

	1926			
	Number	Percentage	1925	1924
Grain and products	2,280,000	4.28	4.49	5.31
Live stock	1,630,000	3.06	3.20	3.57
Coal	10,390,000	19.53	17.32	17.59
Coke	700,000	1.31	1.22	1.07
Forest products	3,650,000	6.85	7.31	7.57
Ore	2,100,000	3.94	3.94	3.46
Mdse., L. C. L.	13,350,000	25.07	25.74	25.80
Misc.	19,150,000	35.96	36.78	35.63
Total	53,250,000	100.00	100.00	100.00

Passenger Business Downward

Turning to the passenger service, the story for 1926 continues discouraging. The aggregate of revenue passenger-miles in 1926 was slightly less than in 1925, and was respectively less than in any previous year back to 1922. Except for 1922, it was the smallest year for passenger traffic in ten years, or since the calendar year 1916.

Statistics of revenue passenger-miles have already appeared in Table I. The reduction for 1926 was six-tenths of one per cent under 1925, and more than 25 per cent below 1920. Yet the past year has been one of general prosperity in the United States, when everybody who wished to travel had or could get the necessary funds. The answer to this continued decline in an important branch of the railway service, which still brings in an annual revenue exceeding a billion dollars, is found in the marvelous growth of the number of private passenger motor cars, motor buses, and miles of improved highways. A collateral explanation lies in the development of foreign travel, which broke all records in 1926, and contributed to the revenues of steamship lines and foreign railways, instead of to rail revenues at home. This comment is intended as a statement of fact, and not by way of complaint. Some of our passenger traffic by rail seems to have gone permanently. What is left must be held, and built up, by reason of superior service, speed and comfort.

Chart *D* strikingly pictures the decline in the passenger miles of 1926, month by month, below the average annual levels of the five-year period to 1925.

Financial Results in 1926

Total operating revenues of railways of Class 1 amounted to $6,467,000,000 in 1926, compared with $6,187,000,000 in 1925. This was an increase of $280,000,000 or 4.5 per cent. These revenues in 1926 were greater than in any previous year, although both the passenger revenue and the mail revenue declined. The largest increase, both relatively and absolutely, occurred in the freight revenue, and reflected the increase of seven per cent in ton-miles.

Total operating expenses in 1926 aggregated $4,705,000,000, which was an increase of $122,000,000, or 2.7 per cent, over 1925. The increase over the expenses of 1924 was 3.2 per cent. Operating expenses last year were less than in 1923 and 1920, but were greater than in any other previous year.

The operating ratio, which indicates the relationship between revenues and expenses, showed a decline under 1925, dropping to 72.7 per cent. A progressive reduction in this ratio has occurred each year from 1920 through to 1926, and for the first time last year began to approach the level of 70 per cent which before the war was regarded as a fair basis of relationship between railway revenues and expenses. The lowest ratio attained in the ten years to 1926 was 70.5 per cent, which was in 1917.

Railway taxes continued to break all records. For the railways of Class I, the total amount of taxes paid in 1926 ran so close to $400,000,000 that at the present writing they appear to have practically reached that figure. Including smaller lines, the total tax bill of the railways of all classes in the United States for the first time aggregated more than $400,000,000. The increase of 10.2 per cent over 1925 was the greatest relative increase of any individual year since 1923, and indicates that the rising flood of taxation continues without any sign of halting, let alone recession. During the past decade, or from 1916 to 1926, the railway tax bill has increased over 150 per cent, contrasted with an increase of 23 per cent in ton-miles and only three per cent in passenger-miles. No commentary is needed on the additional charge that must be placed on each ton-mile and each passenger-mile, because of this increase in the taxation burden.

Again in 1926, and for the fifth successive year, taxes paid by the railways exceeded the amount of cash dividends paid.

The total net railway operating income for 1926 was $1,250,000,000. This was an increase of $113,000,000, or 9.9 per cent, over the aggregate of $1,137,000,000 for 1925. The total was greater than for any previous year, but the rate of return on investment, which is the significant measure, showed a much smaller increase. Compared with 1916, the previous high year in this respect, the aggregate for 1926 was greater, while the rate of return was much less—5.21 per cent in 1926, compared to 5.90 per cent in 1916.

This fact is due to the relatively greater increase in railway investment than in net income, the latter being the current item which must carry the investment and supply a credit basis for it.

The rate of return on property investment was 5.21 per cent in 1926, compared with 4.84 per cent in 1925. The average annual rate of return for the five years to 1925 was 4.06 per cent. While there has been an almost steady improvement in the rate earned since 1920, as indicated by the following table, a return of 5.21 per cent on investment cannot be regarded as excessive compensation to railway owners for the record breaking service supplied by their railroad lines during the past year:

	Rate of return on investment		Rate of return on investment
1920	0.09 per cent	1924	4.33 per cent
1921	2.92 per cent	1925	4.84 per cent
1922	3.61 per cent	1926	5.21 per cent
1923	4.48 per cent		

Table IV is a brief summary of revenues, expenses, taxes, net operating income, and return on property investment, for the year 1926, compared with 1925 and the five-year period 1921 to 1925.

Table IV—Condensed Income Account

	1926 (millions)	1925 (millions)	Five-year average 1921-1925 (millions)
Total operating revenues	$6,467	$6,187	$5,946
Total operating expenses	4,705	4,583	4,630
Taxes	400	363	326
Net operating income	1,250	1,137	900
Return on property investment	5.21	4.84	4.06

Operating Revenues

Total operating revenues, aggregating $6,467,000,000 in 1926, increased 4.5 per cent over 1925, and nine per cent over the preceding five-year average.

The greatest relative increase, compared with 1925, was that of freight revenue, which increased from $4,553,000,000 in 1925 to $4,825,000,000 in 1926, or 6.0 per cent.

Passenger revenue fell off $10,000,000 to $1,046,000,000 in 1926, which was a decline of 0.9 per cent. This closely paralleled the decline of six-tenths of one per cent in passenger traffic.

Mail revenue declined one per cent. Express revenue

increased 2.1 per cent, and all other revenues showed an increase of 5.1 per cent.

Table V is a statement of the various items of operating revenue, in which the returns for 1926 are compared with those of 1925 and the five-year period.

Table V—Railway Operating Revenues

	1926 (millions)	1925 (millions)	Five-year-average 1921-1925 (millions)
Freight revenue	$4,825	$4,553	$4,293
Passenger revenue	1,046	1,056	1,102
Mail revenue	96	97	95
Express revenue	148	145	138
All other revenue	352	336	318
Total	$6,467	$6,187	$5,946

Operating Expenses

Total operating expenses for 1926 amounted to $4,705,000,000, which was an increase of $122,000,000 over 1925, or 2.7 per cent. The increase over the annual average of the preceding five-year period was 1.6 per cent.

The increase in expenditures in 1926 is fully explained by the increased traffic and service handled by the railways.

Traffic expenses showed the greatest relative increase, 7.5 per cent, followed by increases of 5.7 per cent in maintenance of way, and 4.1 per cent in general and other expenses. Maintenance of equipment expenses increased 1.8 per cent, and transportation expenses 1.6 per cent.

Combining the two maintenance accounts, the increase between 1925 and 1926 was $70,000,000, or 3.3 per cent. The increase in transportation expenses was $35,000,000, which was a relative increase of 1.6 per cent. In the face of a ton-mile increase of seven per cent, and a passenger service (measured in train-miles) little if any smaller than in 1925, the success of the railways in controlling their maintenance and transportation costs within the limits named indicates a distinct advance in economical operation. This is particularly true of the transportation expenses, which reflected improved performance as to fuel consumption, heavier train loading,

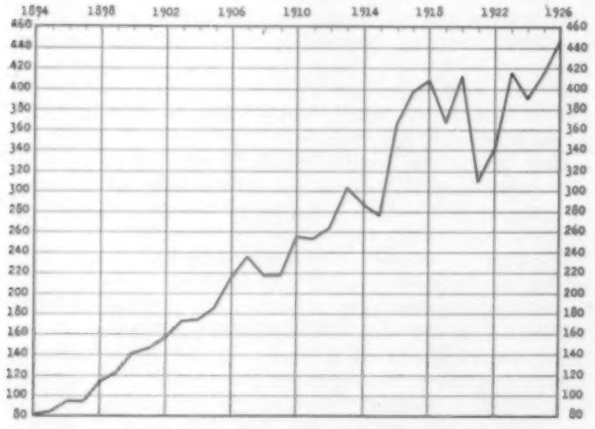


Chart A—Revenue Ton-Miles in Billions, All Railways (1894 to 1926)

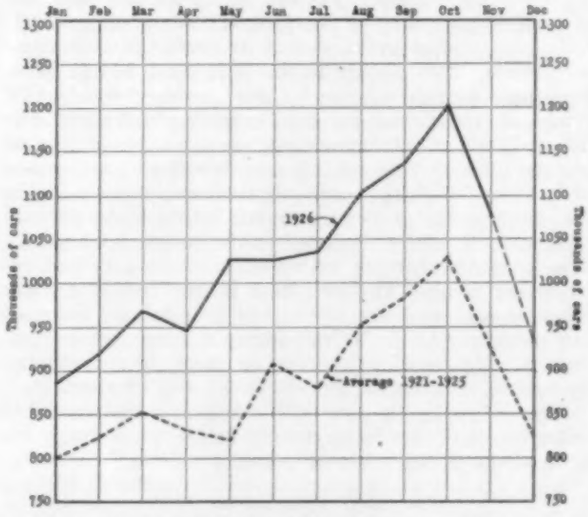


Chart B—Average Weekly Carloadings, by Months, All Commodities

(5-Year Average 1921-1925, and Year 1926)

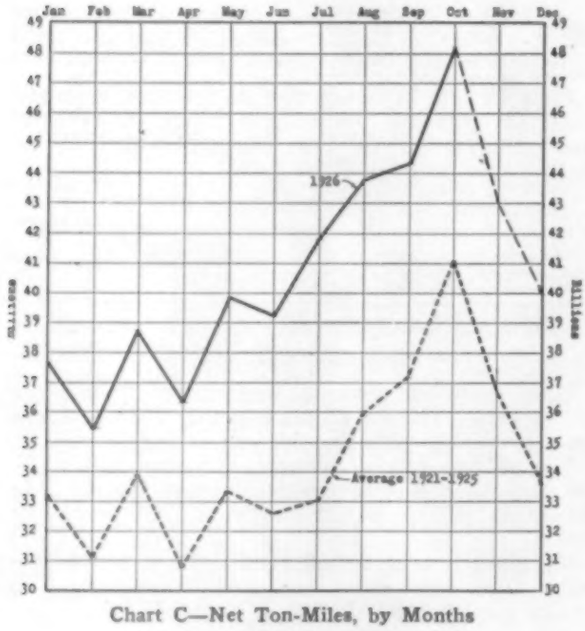


Chart C—Net Ton-Miles, by Months

(5-Year Average 1921-1925, and Year 1926)

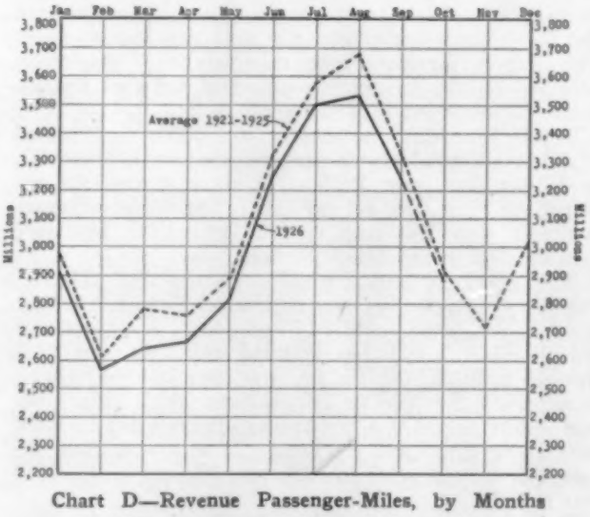


Chart D—Revenue Passenger-Miles, by Months

(5-Year Average 1921-1925, and Year 1926)

smaller freight damage, and many other factors of efficiency.

Table VI presents the various items of operating expenses in 1926, compared with 1925 and the five-year average.

Table VI—Railway Operating Expenses

	1926 (millions)	1925 (millions)	Five-year average 1921-1925 (millions)
Maintenance of way	$872	$825	$790
Maintenance of equipment	1,292	1,269	1,306
Traffic	114	106	94
Transportation	2,201	2,166	2,233
General and other	226	217	207
	4,705	4,583	4,630

The declining ratio of expenses to revenues has already been mentioned. This decline was so marked and so consistent, from 1920 to 1926, that the comparative figures are worth setting down, as follows:

	Operating ratio		Operating ratio
1920	93.7 per cent	1924	76.2 per cent
1921	82.6 per cent	1925	74.1 per cent
1922	79.3 per cent	1926	72.7 per cent
1923	77.7 per cent		

It will be recalled that 1920 marked an unenviable peak in this respect, there being a steady rise in the operating ratio during the war and Federal Control period, from 65.5 per cent in 1916 to 93.7 per cent in 1920.

Receipts Per Traffic Unit

The financial statistics just presented show that the railways earned increased revenues in 1926. What the public paid for railway transportation service per unit—that is, the price of transportation—is more significant than the aggregate receipts. In the freight service, average receipts per unit were less in 1926 than in any previous year since 1921. In the passenger service, they were lower than for any year except 1925.

Average receipts per ton-mile in 1926 approximated 1.087 cents, compared with 1.097 cents in 1925. This was a reduction of 0.01 cent, or approximately one per cent. The average for 1925 was itself nearly 14 per cent lower than it was in 1921. The further decline in 1926 brought the average for that year to a point 14.7

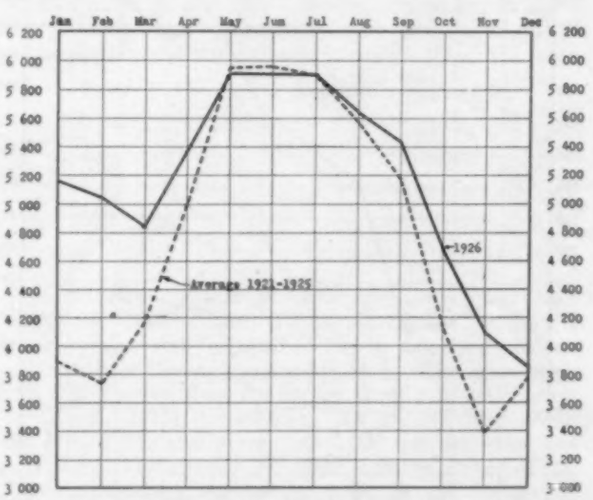


Chart E—Stored Serviceable Locomotives, by Months

(5-Year Average 1921-1925, and Year 1926)

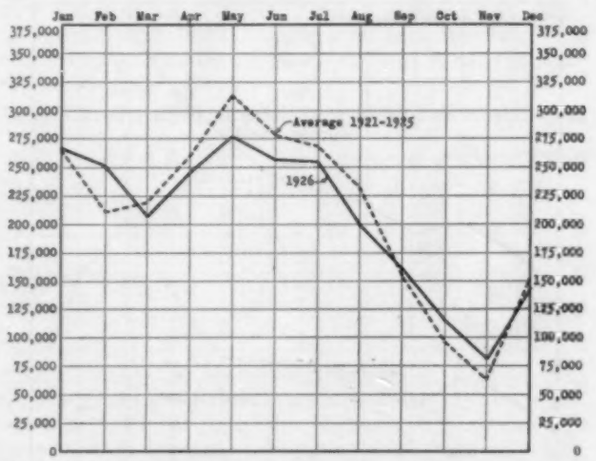


Chart F—Average Daily Freight Car Surplus, by Months

(5-Year Average 1921-1925, and Year 1926)

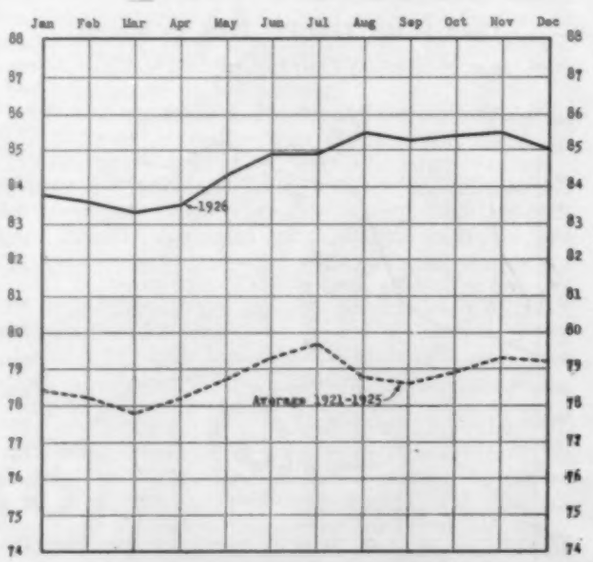


Chart G—Percentage of Locomotives in Serviceable Condition, by Months

(5-Year Average 1921-1925, and Year 1926)

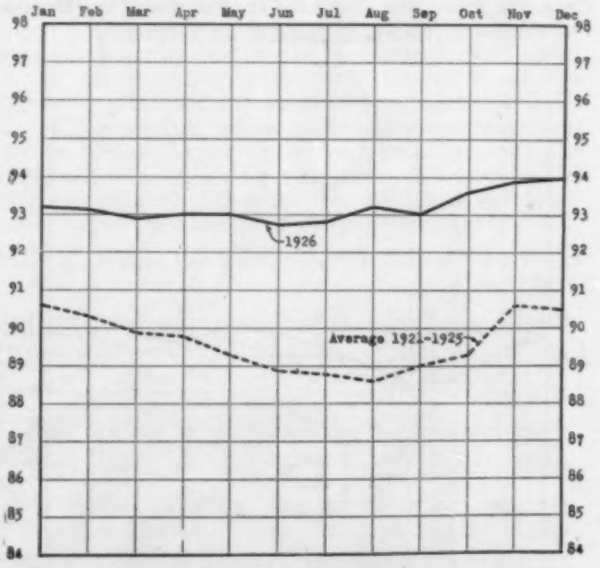


Chart H—Percentage of Freight Cars in Serviceable Condition, by Months

(5-Year Average 1921-1925, and Year 1926)

per cent below the highest post-war average, which occurred in 1921 as the result of the rate increases of 1920.

Average receipts per passenger mile for 1926 were slightly greater than the average for 1925, but 4.4 per cent below 1921.

Table VII—Receipts Per Ton-Mile and Passenger-Mile (1921-1926)

	Receipts per ton-mile (cents)	Receipts per passenger-mile (cents)
1921	1.275	3.086
1922	1.177	3.027
1923	1.116	3.018
1924	1.116	2.978
1925	1.097	2.938
1921–1925	1.147	3.010
1926	1.087	2.950
Per cent decrease:		
1926 under 1921	14.7	4.4
1926 under 1921–1925	5.2	2.0
1926 under 1925	0.9	*0.4

*Increase.

The averages year by year since 1921, also the five-year averages to 1925, appear in Table VII.

Capital Expenditures

The contribution of the capital improvements of the past few years to the increased efficiency of railway operation has been so great and so marked that attention may be devoted to statistics of capital expenditures since 1923, when the railways instituted a definite program of improvement in plant and operations.

The capital expenditures of the railways of Class I during the past four years have been as follows:

1923	$1,059,000,000
1924	875,000,000
1925	748,000,000
1926	875,000,000
Total	$3,557,000,000

This aggregate expenditure of more than 3½ billions of new capital during the past four years, which repre-

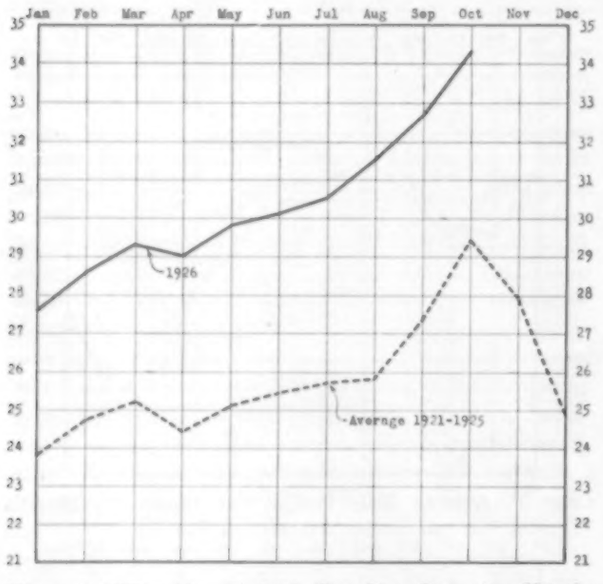


Chart I—Miles Per Freight Car Per Day, by Months
(5-Year Average 1921-1925, and Year 1926)

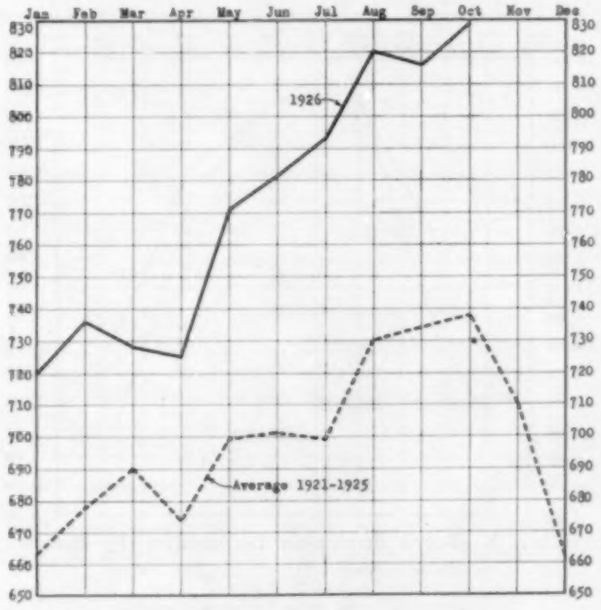


Chart J—Net Tons Per Train, by Months
(5-Year Average 1921-1925, and Year 1926)

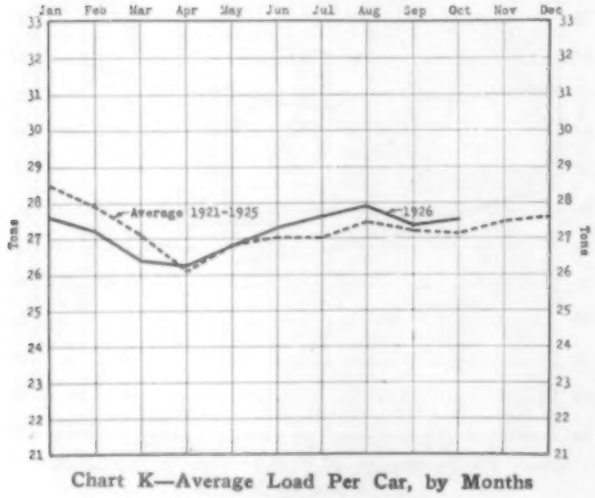


Chart K—Average Load Per Car, by Months
(5-Year Average 1921-1925, and Year 1926)

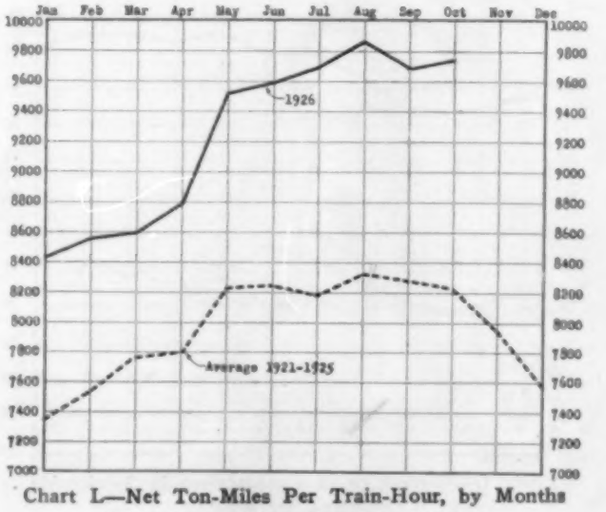


Chart L—Net Ton-Miles Per Train-Hour, by Months
(5-Year Average 1921-1925, and Year 1926)

sents an annual average close to $900,000,000 per year, supplies one significant reason why railway efficiency reached so satisfactory a level in 1926.

The total program of capital improvement on which the railways were working during the year 1926 amounted to $1,325,000,000.

There was brought over from 1925, in the form of unexpended authorizations for various individual programs then in effect, a total of $475,000,000. This total was augmented by additional authorizations during 1926 amounting to $850,000,000, making a total of authorized expenditures under way during the year aggregating $1,325,000,000. This program as a whole compared favorably with any recent year except 1923. The carry-over into 1927 is $450,000,000.

Details of the estimated capital expenditures in 1926 are given in Table VIII.

From 1923 to 1926 there occurred a steady decline in the proportion of total capital expenditures devoted to the purchase of new equipment. This proportion, which was 64.4 per cent in 1923, fell to 56.4 per cent in 1924, to 45 per cent in 1925, and to 43.4 per cent in 1926. For the four years as a whole, however, capital expenditures were divided almost exactly between equipment on the one hand and roadway and structures on the other hand.

Table VIII—Capital Expenditures in 1926

Locomotives	$96,000,000
Freight-train cars	210,000,000
Passenger-train cars	55,000,000
Other equipment	19,000,000
Additional track	174,000,000
Heavier rail	39,000,000
Additional ballast	18,000,000
Shops, enginehouses and mach.	40,000,000
All other improvements	224,000,000
Total	$875,000,000

Installations of locomotives were on a greater scale during 1926 than during the previous year. In fact, a larger number was installed in eleven months than during the whole twelve months of 1925. The aggregates were 2,193 locomotives for eleven months in 1926, compared with 1,604 locomotives for the corresponding period in 1925, and a total of 1,733 for the complete year 1925. The greatly increased tractive power of the newer locomotives represented a significant feature of equipment purchases. The new locomotives averaged 56,565 pounds of tractive effort per locomotive. They replaced so many locomotives of smaller size and power that the aggregate of pounds of tractive effort of all locomotives in service was increased by 26,000,000 pounds, while the average per locomotive rose from 40,626 pounds to 41,548 pounds.

Similarly, although installations of freight cars during 1926 were much smaller than during 1925, the trend was distinctly toward a car of larger capacity, resulting in a substantial increase in the over-all average. The aggregate number installed during 1926 approximated 100,000, compared with 125,760 in 1925. The aggregate capacity of all freight cars in service increased by more than 900,000 tons, or nearly one per cent, while the average capacity per car went up from 44.7 tons to 45.2 tons.

As in 1925, both locomotives and freight cars were retired in considerable numbers, which was one factor leading to a net increase in the number of pounds of power or tons of capacity per unit remaining in service.

The number both of locomotives and cars on order at the end of November was slightly increased by orders placed during the next preceding months. Locomotives on order at the end of November numbered 344, compared with 471 at the end of 1925, while the number of freight cars on order was 11,591, compared with 40,015 at the end of 1925. This indicates that deliveries of new locomotives and cars early in 1927 will be lighter than during the corresponding period of 1926, whether or not new orders are placed in larger quantity during the first few months of the new year than in 1926.

Reserve Equipment

Attention was frequently directed in 1924 and 1925 to the fact that the railways were handling a large freight traffic with at all times a reserve fund of motive power and of freight cars. This condition was also strikingly present during 1926.

The general situation as to reserve equipment is summarized in Tables IX and X, which show for the first of each month, from January 1 to December 1, 1926, the number of stored locomotives and surplus freight cars, respectively. Comparisons are made with 1925 and also with the five-year average to 1925.

Table IX carries the statistics for stored locomotives. Chart *E* is the corresponding graphic statement, by months, for the year 1926, compared with the five-year average. The chart exhibits a remarkable margin between the curve for 1926 and that for the five-year average, the line for 1926 being much higher at all times. Compared with 1925, however, the table shows a generally smaller number of locomotives in storage in 1926 than during the previous year.

Table IX—Stored Serviceable Locomotives on First Day of Each Month

	1926	1925	Average 1921-1925
January	5,166	4,849	3,894
February	5,048	4,220	3,740
March	4,839	4,988	4,170
April	5,370	6,241	4,996
May	5,918	6,697	5,948
June	5,913	6,618	5,961
July	5,909	6,600	5,909
August	5,643	6,313	5,575
September	5,432	5,902	5,183
October	4,680	5,337	4,137
November	4,102	4,450	3,397
December	4,052	4,656	3,782

The number of stored locomotives in 1926 ranged from a minimum of 3,841, on November 15, to a maximum of 5,978 on June 15. Neither the minimum nor the maximum appears in the table, which deals only with statistics as of the first of each month. These surplus locomotives, the majority of which were good for immediate service and were a potential reserve of motive power for the haulage of freight and passengers, represented the continuance of a guarantee from the railways to the public that the transportation situation continued satisfactory, and would be protected at all times.

The corresponding story with respect to surplus freight cars, in good physical condition, appears in Table X. This statement relates to freight cars reported as idle, or surplus, on the first of each month in 1925 and 1926, and the average for five years. The surplus for 1926 ran generally below that for 1925, and to a lesser extent below the average of the five-year period.

Table X—Freight Car Surplus on First Day of Each Month

	1926	1925	Average 1921-1925
January	267,739	266,252	266,165
February	250,935	213,921	212,882
March	207,683	285,015	219,131
April	246,549	344,959	262,021
May	276,573	337,181	314,823
June	257,956	323,624	278,766
July	234,807	307,495	268,107
August	199,073	263,876	231,913
September	161,478	162,397	155,566
October	114,188	140,842	95,508
November	81,011	111,619	63,835
December	144,921	136,796	152,458

The number of surplus cars ranged from a minimum of 79,016 in October to a maximum of 310,155 in January. Neither this maximum nor minimum appears in the table, which like the previous table covers only surplus equipment as of the first of each month.

The margin of freight car supply over car needs, in terms of car surplus, averaged well over 200,000 cars during the year.

Chart *F* presents the average daily freight car surplus, by months during 1926, compared with the five-year average from 1921 to 1925.

Corollary to statistics of freight car surplus are those of car shortage. One factor is in a sense the reverse of the other; absence of car shortage may be regarded as a negative virtue, while the presence of a car surplus is certainly a positive virtue.

Car shortage was smaller in 1926 than in any recent period of time. The stubborn way in which the reports of car shortage in 1926 stuck close to zero tells the story of absence of car shortage graphically and emphatically. These reports are made on a quarter-monthly basis. Of 44 compilations so made during the first eleven months of 1926, three carried a story of no shortage whatever, 19 additional periods reported less than 100 cars of shortage, while only three reported more than 1,000 cars, and none as many as 2,000 cars. Reports for the corresponding period of 1925, which also showed excellent results in this phase of car supply, showed two weeks of no car shortage, 17 additional periods below 100 cars, 6 above 1,000 cars, and two above 2,000.

The average shortage reported for the eleven months of 1926 was 303 cars, compared with corresponding averages of 460 cars in 1925 and 1,124 cars in 1924. The car shortage problem, which had been approaching the vanishing point in 1924 and 1925, virtually disappeared from view in 1926.

Railway Operating Efficiency

Competent observers of railway performance during the year 1926 generally agree that the operating efficiency of the railways of the United States reached new high levels last year.

These high levels, as already pointed out, were another forward step in the progressive improvement of railway operations since the beginning of 1923. It is to be hoped that they do not represent a final peak, but that railway performance will go forward to even higher levels in 1927 and successive years. There can be no compromise with the problem of efficiency. The problem is always present, in good times and bad, whether we deal with it as individuals or as collective organisms. No person or organization ever attains perfection, and too great a satisfaction with current performance is a danger signal.

Some of the tables and charts already discussed have presented a significant picture of the efficiency of railway operation in 1926. They have shown the healthy situation as regards reserve motive power and freight car capacity, and the virtual disappearance of any freight car shortage during the year.

Closely related to statistics of reserve equipment are those that tell of the physical condition of the equipment actually at work. Charts *G* and *H* deal with this subject, and relate to locomotives and freight cars, respectively.

Chart G presents a graphic picture of the percentage of locomotives in serviceable condition during each month of 1926, compared with the average month of the previous five years. Chart *H* presents a similar picture for freight cars. In both charts, the curve for 1926 runs consistently above the corresponding five-year curve, this being especially true in the case of locomotives.

The next table carries the story into the important field of the effective handling of freight cars, that is, miles per freight car per day. Table XI presents these averages for the first ten months of 1926, and by months for 1925 and the five years.

Table XI—Miles Per Freight Car Per Day, by Months

	1926	1925	Average 1921-1925
January	27.6	26.5	24.2
February	28.6	26.9	24.7
March	29.3	26.4	25.2
April	29.0	26.6	24.4
May	29.8	27.4	25.1
June	30.1	27.5	25.4
July	30.5	27.8	24.7
August	31.5	29.6	25.8
September	32.7	30.8	27.3
October	34.3	32.2	29.4
November	...	30.9	27.9
December	...	27.9	24.9

The table discloses that the average of daily car movement was higher for every month of 1926 (to October) than during the corresponding months of 1925 and the average five-year period to 1925; also that in five of the later months of the year 1926 the average surpassed thirty miles per day, reaching a record level of 34.3 miles in October. The average for the ten months to October also surpassed thirty miles, being 30.4 miles per car day in 1926, compared with 28.2 miles for the corresponding period of 1925. This increase of 2.2 miles, or nearly eight per cent, over 1925 represented a real operating achievement in railway annals.

It will be recalled that one of the items in the railway program of 1923 was to attain an average car movement of thirty miles per day. The goal was not reached in that year, nor in any year to 1925, except at sporadic intervals. Last year, however, it was surpassed in five separate months, and during the first ten months, while the average for the year appears likely to be close to, if not in excess of, the thirty-mile goal set three years earlier.

Chart *I* indicates in graphic form the considerable improvement that took place during the year in this important feature of operating efficiency.

If it appears that an average of thirty miles per car per day is not a high average of freight movement, it should be recalled that this average is computed by dividing the total number of freight car miles by the total number of freight cars, including idle or surplus cars, cars in or awaiting shop, and cars temporarily in the hands of shippers for the purpose of loading and unloading. It is not a statement of the average movement of freight cars while actually in motion, but merely represents the average number of miles made each calendar day in the year by all cars in the railway service on that day.

To eliminate the difference between various years, due to the fact that some years show a larger or smaller number of cars in shop, and a larger or smaller number of idle cars, than in other years, comparison may be made of 1926 with earlier years on the basis of the average daily movement of what may be called "active" cars, that is, serviceable cars not reported as idle. This eliminates all cars awaiting or undergoing shop repairs, and also eliminates idle or surplus equipment. It does not eliminate cars in the hands of shippers for loading and unloading.

Utilizing this revised basis, and applying it to the average mileage per car in 1926, we find that the movement per active car per day (to October) was 35.7 miles, compared with 34.4 miles in the corresponding period of 1925. On the same basis, the average attained during the month of October was 37.9 miles, which was the highest on record.

The average daily movement of freight locomotives is also an indication of railway operating efficiency. The number of miles per freight locomotive day in 1926 (to

October) averaged 61.3 miles, compared with an average of 58.2 miles for the year 1925, and 55.2 miles for the five-year period ending 1925. The average for ten months of 1926 was slightly under the highest previous average of 62.5 miles attained in 1920. The detailed figures are presented in Table XII, which shows a consistent improvement for each of the months shown for 1926, whether compared with 1925 or the five-year average. The average of 67.5 miles reached in October was the highest recorded for any single month in railway history.

Table XII—Locomotive-Miles Per Freight Locomotive Day, by Months

	1926	1925	Average 1921-1925
January	59.6	57.7	55.4
February	61.1	57.0	55.6
March	60.6	54.1	54.5
April	58.9	53.8	51.6
May	59.0	54.7	52.3
June	59.4	55.4	52.9
July	60.4	56.3	51.9
August	61.4	59.0	53.9
September	64.9	62.0	57.3
October	67.5	65.5	61.3
November	...	63.5	59.0
December	...	60.1	55.2

As in the case of freight cars, these averages of freight locomotive miles per day are computed on a basis that includes locomotives in or awaiting shop, and stored or surplus locomotives. A revision of the averages along the same line already presented for freight cars, by omitting from the calculation the number of stored and unserviceable locomotives, brings the average number of miles per "active" locomotive per day in 1926 (to October) up to 85.1 miles per day. This compares with an average of 82.0 miles for the corresponding period of 1925, and a five-year average of 80.1 miles. The average for October was the highest on record for any single month.

Locomotive performance in the passenger service was also at a maximum level in 1926. During the first ten months of the year, the average number of miles per passenger locomotive per day ran consistently greater than in any previous corresponding month. The ten-month average for 1926 was 113.5 miles, compared with 110.1 miles in 1925 and 108.8 miles in 1924. The average of 115.9 miles reported for July, 1926, was the high mark for any single month. All records were thus broken in 1926, both for a single month, for each of the individual months, for the ten months to October, and probably for the year as a whole.

Table XIII—Net Tons Per Train, by Months

	1926	1925	Average 1921-1925
January	720	709	663
February	736	722	678
March	728	720	690
April	725	712	674
May	771	755	699
June	781	744	701
July	793	758	699
August	820	796	730
September	816	777	734
October	829	760	737
November	...	755	710
December	...	716	662

Still another factor of operating efficiency to reach record levels in 1926 was the average freight train load, technically denominated "net tons per train." Table XIII carries the statistics for this factor, for the first ten months of 1926, for the several months of 1925, and for the five-year average to 1925. Chart *J* presents a similar story in graphic form, comparing 1926 by months with the five-year period.

The table and chart just presented tell their story of achievement in 1926. Not only was the average train-load greater during every month shown for 1926 than for the corresponding months of 1925 and the five-year period, but the previous high monthly average of 796 tons (August, 1925) was exceeded three times in 1926. The months of August, September, and October all broke the record, the high mark of 829 tons set in October being 33 tons greater than the record of any previous year. Heavy movement of coal had its effect on this result, as well as the increased number of cars per freight train, which averaged 45.3 cars during the first ten months of 1926, compared with 43.8 cars for the year 1925.

Chart *K* corresponds to Chart *J*, but shows the average monthly carload, as contrasted with the average monthly trainload. Table XIV presents the statistics for each month of 1926 to October, and for the several months of 1925 and the five years.

Although there was some improvement in the load per freight car in 1926 compared with 1925, the average was below that of the previous five years, and still considerably below the goal of thirty tons per car aimed at as a part of the efficiency program of 1923. The average load per freight car in 1926 (to October) was 27.2 tons, compared with 26.9 tons in 1925, and a five-year average of 27.3 tons. Of the first ten months in 1926, seven showed improvement over 1925, one no improvement, and two a loss.

Table XIV—Net Tons Per Loaded Car, by Months

	1926	1925	Average 1921-1925
January	27.6	28.0	28.5
February	27.2	27.2	27.9
March	26.4	26.1	27.1
April	26.2	25.9	26.1
May	26.8	26.9	26.8
June	27.3	26.9	27.0
July	27.6	27.2	27.0
August	27.9	27.8	27.4
September	27.3	26.8	27.1
October	27.5	26.3	27.1
November	...	27.2	27.4
December	...	27.6	27.6

In considering these statistics of average carload, care must be taken to distinguish them from some of the other factors of railway operating efficiency. The others are largely if not wholly within the control of the railway managements; loading of cars, however, is to a considerable degree governed by the character of commodity to be moved and by the practices of the shippers. The improvement noted for 1926 was undoubtedly due to effective co-operation from many of the leading shippers and shippers' organizations along the line of better and bigger loading.

Among the significant efficiency factors, average net ton-miles per freight car day stands out as of great importance. This depends chiefly upon the fact that the average takes into account both the carload and the daily distance travelled by a freight car.

This average was 529 ton-miles per car day in 1926, which was greater than in any previous year. It compares with an average of 492 ton-miles in 1925, and a corresponding average of 457 ton-miles during the previous five years.

Table XV—Net Ton-Miles Per Train-Hour, by Months

	1926	1925	Average 1921-1925
January	8,432	8,064	7,351
February	8,551	8,299	7,542
March	8,597	8,506	7,770
April	8,797	8,572	7,800
May	9,527	9,222	8,223
June	9,595	9,039	8,238
July	9,705	9,137	8,184
August	9,867	9,426	8,321
September	9,682	9,128	8,292
October	9,755	8,828	8,219
November	...	8,755	7,944
December	....	8,324	7,575

Another similar factor of efficiency is the number of ton-miles per freight train hour. This combines the number of tons per train with the average speed per hour of the average freight train. Statistics covering this factor are presented in Table XV, from which it will be seen that every month in 1926 ran consistently higher than the corresponding month of 1925 and of the previous five years.

In addition, Chart *L* gives the number of net ton-miles per train hour for each month of 1926, compared with the five-year average.

All records were broken for net ton-miles per train hour in 1926. Not only did every month of the year (to October) go to a higher point than in the corresponding month of 1925 and the five years, but the high mark for a single month was raised from the 9,426 ton-miles per train hour previously reached (August, 1925) to 9,867 ton-miles per train hour in August, 1926. For the ten months, the average for 1926 was 9,259 ton-miles, compared with 8,822 for the corresponding period of 1925, which was also a record. The sterling performance already shown in 1925 was thus raised to new levels in 1926.

This performance was due to the record breaking train loads already discussed, and also to record breaking figures for freight train speed, which for the first time last year reached an average of 12.4 miles per hour, in May, and maintained a monthly average of 12 miles during the first ten months.

We turn now to certain efficiency factors that carry specific connotations of economy that can be appraised with some degree of accuracy. These factors are savings in fuel and in freight claim payments.

In the field of fuel consumption, new marks were set in 1926, both for the freight and the passenger service. Tables XVI and XVII carry the statistics, by months, of fuel consumption per unit, in the respective services.

Table XVI presents the average locomotive fuel consumption figures in freight service, in terms of pounds of fuel per 1,000 gross ton-miles. Each month of 1926 to October is compared with the several months of 1925 and the five-year period to 1925.

Table XVI—Pounds of Fuel Per 1,000 Gross Ton-Miles (Including Locomotives and Tender) by Months

	1926	1925	Average 1921-1925
January	158	164	180
February	153	155	175
March	150	148	165
April	140	138	155
May	128	132	146
June	124	127	139
July	121	126	139
August	121	125	139
September	125	128	143
October	130	138	150
November	...	146	160
December	...	156	171

Every month but two, to October, reported an improved fuel performance in 1926 compared with 1925, while every one of the ten months without exception showed considerable gains as against the five-year averages. In this table, a reduction in average fuel consumption per unit means of course an improvement. The average for the ten months to October was 134 pounds per 1,000 G. T. M., compared with 138 in 1925. These are the lowest averages on record for any similar period. The low figure of 121 pounds per 1,000 G. T. M. reported for July and August was the best record of any single month in history.

Less striking results were achieved in the passenger service, but there was a definite improvement during 1926. The average amount of fuel consumed per passenger train car-mile was 15.6 pounds for the ten months shown for 1926, compared with 15.9 pounds in 1925. As in the freight service, a low record for a single month was reached in 1926, 14.3 pounds per car-mile. The average for ten months was also a record. Statistics of locomotive fuel consumption in passenger service appear in Table XVII.

When we recall that President Aishton of the American Railway Association announced two years ago that a saving of *one* pound of coal per 1,000 G. T. M. meant a reduction in the annual railway fuel bill of more than $3,000,000, the effect of a reduction of *four* pounds in 1926 can easily be realized. The saving does not accrue solely to the railways, for it means an appreciable conservation of our natural resources, elimination of waste, and the release of productive capacity into other channels.

Table XVII—Pounds of Fuel Per Passenger Train Car-Mile, by Months

	1926	1925	Average 1921-1925
January	17.7	18.6	19.7
February	17.6	17.9	19.5
March	17.1	17.0	18.6
April	16.2	15.9	17.5
May	15.1	15.6	16.8
June	14.7	14.8	15.9
July	14.3	14.7	15.7
August	14.3	14.7	15.8
September	14.6	14.8	16.1
October	15.4	15.9	17.0
November	...	16.6	17.8
December	...	17.0	18.4

Another element of economical railway operation is that of freight claim payments. The number of claims made on account of loss and damage to freight, and also the payments made on behalf of such claims, were both reduced during 1926. This reduction followed a number of reductions already brought about in that field, by a continuous program of freight claim prevention, carried on by the American Railway Association and the individual railways themselves. In 1920, when the peak of such payments was reached, the payments aggregated nearly $120,000,000. In 1925, the total was brought below $40,000,000 for the first time since the war, and a further reduction was made in 1926 to approximately $32,000,000.

Maximum Performance

To bring into one picture these various factors of efficient operation, the results of each of the twelve months ended with October, 1926, have been compared with the results of the corresponding months for all previous years of record.

For each month, such as January, February, and the like, the maximum performance attained in any year has been noted. Thus for any particular factor, twelve maxima have been found, some of which occurred in one year and some in other years.

These maxima have next been compared with the actual results for the respective months of the twelve month-period from November, 1925, to October, 1926. In a surprising number of cases, it was found that the results for the months of this period were the maxima, and broke all previous records.

In order that this fact may be brought out in a striking way, Table XVIII sets forth statistics of maximum performance in ten selected efficiency factors. The only factors omitted from the list, among those that are frequently utilized, are those showing tons per car and the percentage of loaded to total freight car mileage. As three of these factors are maintained separately for the freight and passenger service, there are 24 possible maximum entries for each of them, representing two entries for each of the twelve months. These factors are marked "F & P" in the table.

It will be noted that of the possible 156 maxima, the year ended in October, 1926 accounted for 132 or five out of every six. In the case of six factors, every month of the twelve here under discussion broke all previous records. These factors were as follows:

Percentage of serviceable locomotives,
Freight car-miles per car day,
Gross and net tons per train,
Gross ton-miles per train hour,
Net ton-miles per train hour.

As a purely statistical presentation of the degree in which the year 1926 attained maximum levels of railway operating efficiency Table XVIII speaks for itself.

Table XVIII—Maximum Performance

(Twelve months ended October, 1926)

Item	Total monthly entries	Entries representing maximum performance
Percentage serviceable loco. (F. & P.)	24	24
Percentage serviceable freight cars	12	6
Car miles per car day	12	12
Ton miles per car day	12	8
Tons per train	12	12
Gross tons per train	12	12
Gross ton miles per train hour	12	12
Locomotive miles per day (F. & P.)	24	14
Fuel per unit (F. & P.)	24	20
Ton miles per train hour	12	12
Total	156	132

If additional emphasis of this situation were needed, it can be abundantly supplied from the testimony of impartial observers from outside the railroad industry. Two such testimonials will be sufficient here, both from unimpeachable sources.

Secretary Hoover, in the latest annual report of the Department of Commerce, devotes a section to the elimination of waste in railway transportation. This he regards as a most important phase of greater industrial efficiency in all lines. He said: "Probably the most outstanding single industrial accomplishment since the war has been the reorganization of our American railways."

After recounting the demoralization resulting from government operation and other causes, Mr. Hoover continued as follows:

"The railways, during the past five years, not only have built up adequate service and given a complete correction to these ills, but they have, by great ability of their managers, greatly reduced transportation costs and thus made rate reductions possible which would not have been otherwise the case."

* * *

"The result of this great reorganization upon the whole economic fabric of the country has been far-reaching. Rapid dispatch has greatly reduced the inventories of the country, has contributed to stabilization of production and employment, and has increased the efficiency of all production and distribution."

Of characteristic brevity, but equally to the point, is the statement of President Coolidge, in his recent message to Congress, when he said:

"It would be difficult to conceive of any modern activity which contributes more to the necessities and conveniences of life than transportation. Without it our present agricultural production and practically all of our commerce would be completely prostrated. One of the large contributing causes to the present highly satisfactory state of our economic condition is the prompt and dependable service, surpassing all our previous records, rendered by the railroads. This power has been fostered by the spirit of co-operation between Federal and State regulatory commissions."

The Railway Personnel

The total number of railway employees of Class I in 1926 averaged close to 1,800,000, compared with 1,769,000 in 1925. This increase of 30,000 is fully explained by the increase in freight traffic during the year.

The aggregate compensation of all employees during 1926 amounted to $2,980,000,000, which was greater than in 1925 by $80,000,000. This was a slightly greater relative increase in compensation than in number of employees, which is accounted for by the fact that the average compensation per employee was greater in 1926 than in 1925. The increase for 1926 was on top of an increase in average compensation that occurred in 1925. The increase was made possible in part by greater earnings per hour, which in turn were due to upward wage adjustments in certain of the various occupation classes.

The various adjustments made it possible for the average railway employee in 1926 to earn an aggregate compensation of $1,655 for the year, compared with $1,639 in 1925, and $1,613 in 1924.

As the number of hours of overtime worked was less in 1926 than in 1925, and was less in 1925 than in 1924, both absolutely and relatively, the increase in average earnings per hour and per year was not due to the overtime factor, but must have been the result of actual increases in wage rates.

Perhaps the best way of setting this out in figures is to use the average number of hours worked per man per year, including overtime, during the past three years. This will give some clue to the actual amount of effort put forth by each man in return for his increase in annual compensation. The averages apply to men paid on an hourly basis only. In 1926, the number of hours per man was slightly less than in 1925, and about the same as in 1924. It seems clear that the increase in compensation in 1926 was not due to any increase in hours, but must have been due, instead, to increased wage rates.

If added proof were required, it would be supplied by reference to average compensation per hour in the three years.

Table XIX gives these statistics for the years 1924 and 1925 as a whole, and for the first nine months of 1926. This table, which is restricted to employees paid on an hourly basis, is set up to show each of the principal groups of employees separately, in order that so far as possible like shall be compared with like.

The table covers 1,645,000 employees (1925) out of a total of 1,769,000. It includes every class except those whose functions are supervisory, professional, or executive. Class I (executives, etc.) is wholly of this type, and is omitted. Class VIb, the train and engine service forces, is wholly on an hourly basis. Class III are the maintenance of way groups, Class IV the maintenance of equipment forces, Class V the transportation groups other than train, engine and yard, and Class VIa the yard forces.

Table XIX shows clearly that every class of railway employees paid on an hourly basis improved its position, as regards earnings per hour, during the past three years. While the increases were relatively small in both 1925 and 1926, they were cumulative. An increase from 1924 to 1926 of 1.1 cents per hour may look small, but when applied to a total of four billion man hours, the result is a payroll increase of more than $40,000,000.

Table XIX—Average Earnings in Cents Per Hour

(Employees on hourly basis of pay)

Class	1926 (nine months)	1925 (year)	1924 (year)
II	62.5	61.8	61.3
III	43.6	43.5	43.2
IV	61.0	60.4	59.8
V	55.7	55.3	54.9
VIa	66.1	65.9	64.2
VIb	92.0	91.5	89.0
Total (II-VI)	62.6	62.4	61.5

Conclusion

This review of railway operations in 1926 has failed of its purpose if there does not run through it a definite note of railway achievement during the year. Statistical and unromantic as the presentation must necessarily be, yet it carries some picture of the human accomplishments of the year. Managements and men, working co-operatively, comprise the human machine which, after all, secures the results. Statistics of performance are merely the records, set down in cold type after the application of brain and brawn to railway problems.

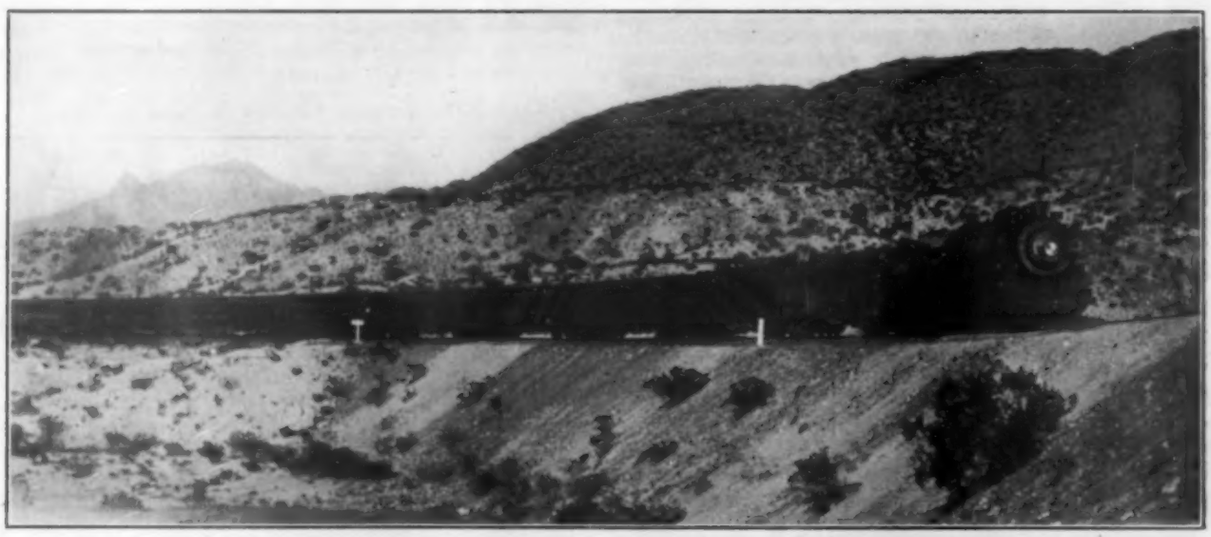
If those students of the future are correct, who are

predicting a recession in general business during 1927, then the railway achievement of the year 1926 may not be immediately repeated. But in many respects it takes a more intelligent organization and a higher type of morale to produce good working results under conditions of reduced traffic than when the pressure of traffic drives men at top speed, despite the inertia of normal humanity. Whether the recession comes or not, one prediction is safe. During the next few years, the railways will be called upon to consolidate their position in respect of efficient operation, to place their present high level of efficiency onto a permanent basis, and to continue to supply a sterling brand of transportation service to the American people.

Highgrade public service is, in short, the first, final, and foremost function of the railroads. Their accomplishments of the past four years lead direct to the expectation that those accomplishments will continue. Their future task will be relatively greater than in the past, because they have raised their operations to a high level, and must live up to the expectations which their recent efficiency has inspired.

The record breaking traffic and performance of 1926 leaves behind it one regret. With every possible effort for greater efficiency and economy, the railways failed to earn as much as 5¼ per cent on their property investment. Whether this is a "fair return" or not is hardly worth debating. It certainly supplies no margin over any theoretical basis of fair return. If a margin cannot be earned in good times, where is the reserve against hard times? Individual railways, and a few of the regional groups, did well in 1926. Regarding this there can be no dispute. But in the United States as a whole, and particularly in the Western District, the results were far short of what they should have been, under the traffic conditions as they developed during the year 1926, and especially in the light of the efficiency and economy attained.

B. & M. Pine Tree Limited Near Revere, Mass.—Locomotive 3709



The Californian (S. P.-C. R. I. & P.) Westbound near El Paso, Tex.

"L'Alouette," Canadian Pacific-Boston & Maine, Boston-Montreal Train at Woodsville, N. H.

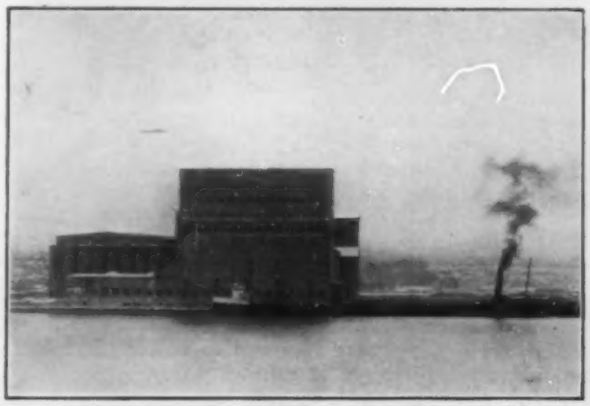
Great Progress in Canada

Both large systems doing well and economic situation generally good—Some rate and wage agitation

By James G. Lyne
Associate Editor, *Railway Age*

THE year 1926 has seen a steady upward swing in economic conditions in Canada. The country was much slower than the United States to begin its recovery from the evil effects of the war. However, in the opinion of competent observers, this time has now been reached and optimism is quite general.

The improved conditions have been reflected in the earnings of the two principal railways, the Canadian Pacific and the Canadian National. These roads during the first nine months of the year had net earnings of $62,413,728, as opposed to $41,430,712 in the same period in 1925—and 1925 was the best post-war year to date. For the first nine months of 1923, net earnings of the two roads were only a little over $30,000,000; thus the railways taken together may be said to be 100 per cent better off than they were only three years ago.



C. N. R. Grain Elevator at Port Arthur, Ont.

This improvement has not resulted entirely from increased traffic. In the first nine months of 1923 the roads handled almost 22 billion ton-miles; in the first nine months of 1923 they handled almost 21 billion—an increase of approximately 5 per cent. Gross earnings for the nine months' period of 1923 totaled 327 millions and in the same period in 1926, 344.8 millions, likewise an increase of about 5 per cent. Plainly the principal source of the improved earnings has been the increase in operating efficiency.

The Canadian National, with this improvement, has ceased to be the burden which it has been for a number of years on the taxpayers of Canada. Sir Henry Thornton, chairman and president of the company, in an address on November 4 estimated that the operating surplus for the year would exceed $45,000,000. This will more than pay the interest on the railroad's debt in the hands of the public. It will not pay all the interest on the advances made by the government to the railroad, however. Heretofore, when the railroad has had deficits, it has been the practice for the government to advance the necessary funds and then to charge the railroad interest thereon as if the advance were an earning asset.

Naturally, it cannot be expected that the railroad should shortly earn sufficient net returns to pay interest on all these advances.

In 1922, the year that the Canadian National was formed by the amalgamation of all the railway properties under the Canadian government, the system had net earnings of $2,886,712 and an operating ratio of 98.77. For the first 10 months of 1926 it had net earnings of $34,060,762 and an operating ratio of 84.31. In the month of October the operating ratio reached the unprecedented low figure of 69.81 per cent.

The Canadian Pacific likewise is prosperous. For the 10 months' period from January to October it had net earnings of $36,500,000, representing an increase of approximately $7,500,000 over the same period of 1925.

Reference has been made above to revenue ton-miles handled. As for revenue tons they totaled 83,269,275 for the first nine months of the year as compared with 74,652,168 or the same period in 1925. Carloadings

advanced from 565,051 in the first nine months of 1923 to 644,312 for the first nine months of 1924.

Future Rate Policy Still Unsettled

The picture of the Canadian railroads, however, is not entirely rosy. There are some aspects of it, indeed, which can be characterized only as unfortunate. Of these perhaps the rate situation is the most important. Canadian freight rates are, comparatively speaking, low, the average ton-mile earning being just under one cent per ton-mile as compared to 1.098 cents in the United States. Readers of the *Railway Age* are familiar with the Crow's Nest Pass rate basis. These rates were put into effect in 1924 and in order to remove discriminations made by putting these rates into effect after their being in abeyance so long the Board of Railway Commissioners has made certain adjustments. However, in 1925, Parliament ordered the Railway Commission to undertake a general rate investigation and revise rates accordingly, taking care not to make grain and flour rates eastward to the head of the Great Lakes any higher than the Crow's Nest basis. The railway board is still making this investigation. Meantime it has placed westward grain movement also on the Crow's Nest basis, although the order to this effect, it is claimed by some of the western interests, is not being fully obeyed. The whole rate situation, then, is "up in the air" and almost anything may happen.

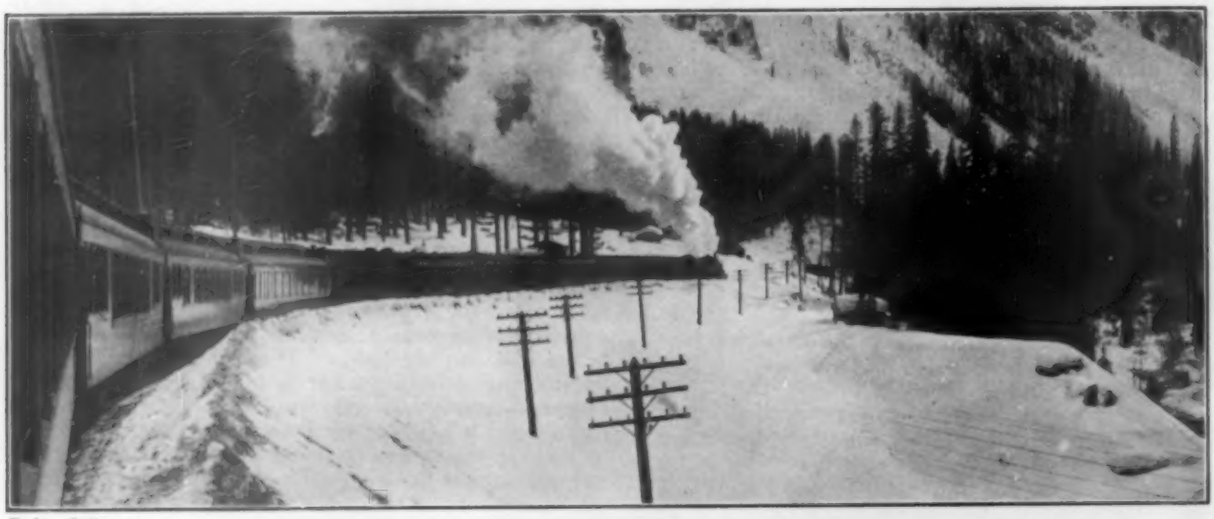
Voluminous testimony has been taken from all important economic interests in the Dominion and, as usual, most of the interests are seeking to be favored with reductions for their particular territory or commodities. It is impossible to tell what the outcome will be. Some observers, however, have pointed out that it is rather unfortunate for so much public attention to be taken up with the roads' prosperity when an important question such as this is mooted. The roads are, to be sure, comparatively prosperous, when the lean years immediately following the war are considered. However, the National Railways have a good way to go before they can pay an adequate return on all the money which the Canadian taxpayers have poured into them. The Canadian Pacific, while doing well, is not earning a return on its property investment which can in any sense of the term be called excessive.

Among the many interests which are seeking favors in the way of rates are the Maritime provinces and the far west. The Maritimes, moreover, object to the use by the Canadian National of Portland, Maine, as an eastern terminal. Other interests would like to have an extremely low export grain rate placed on the National Transcontinental (the C. N. R. line in Northern Ontario and Quebec), in the attempt to divert grain now going by lake to Buffalo and thence to tidewater by American railways. Coal producers in the Maritimes and Alberta would like to have rates to Central Canada which would place their product on a par with American coal.

These are but a few of the contentions which the Board of Railway Commissioners must consider in arriving at their decision, while at the same time they have to think of maintaining railway earnings at a reasonable level.

Little Political Interference

Politically, while the year has been turbulent, the effects on the railways have not been marked. The Liberal government was ousted early in the year and the Conservatives under the leadership of Arthur Meighan came to the head of affairs. Numbered in the Conservative party, but not strong enough to make their voice their party's policy, were a number of persistent critics on the management of the Canadian National Railways. The coming of the Conservatives into power, therefore, brought no important changes. When the fall election came and the Liberals under the leadership of Mackenzie King were returned to power there had been virtually no change in railway policy.



Ewing Galloway

On the C. P. R. in the Canadian Rockies

The Labor Situation

Another condition which may have some effect on the future of the railway situation in Canada is the labor situation. The trainmen have but recently come to terms with the managements on this subject. The increase on the so-called New York Central basis which was applied to wages in train and engine service quite generally throughout the United States in 1924 had never been recognized in Canada. In 1926, when the American train service employees started their move for a further increase the Canadian trainmen made a strong effort to secure the adoption of the New York Central basis in Canada. The case went to arbitration and the

employees' appeal was denied. There followed what was called a "strike vote." What it really was was a vote of confidence in their officers by the train service unionists. The officers could have called a strike if they had so desired following this vote. However, the case was settled without a resort to force. The clerks now have a wage increase request which will be the subject of arbitration.

Canadian railway employees have for a number of years made a strong effort to have their wages equal to those south of the border and, to a large extent, they have been successful. However, it is the contention of the railway managements in which they are joined by some rather powerful Canadian public opinion that there is no logical reason for *ipso facto* similarity. They base this contention on the fact that the cost of living is generally lower in Canada than in the United States; that Canada is a separate country and its economic prob-

Main Lodge, Jasper Park

lems should be worked out with reference to its experience rather than by the servile imitation of United States practice; that railway rates in Canada are not as high as they are in the United States nor are railway earnings protected by a mandatory rate-making provision such as that included in the United States transportation act. Like the rate situation the wage situation in Canada is still "in the air." That it is important no one can doubt. It is just one of those unsolved problems which serve to make the railway situation not entirely a bed of roses in spite of the extremely favorable upturn of railroad earnings and economic conditions generally during the past year.

Immigration and Prosperity

Immigration is a question of the greatest importance to Canada—not only to the country as a whole but to the railways specifically. They have a considerable mileage of lines of extremely light traffic upon which business must continue meager until the population increases. The railways are co-operating with the government in a systematic plan of securing as immigrants agricultural workers and homesteaders particularly from the British Isles. That this program is meeting with success and has ample promise for the future is testified to by Sir Henry Thornton, president of the Canadian National, who recently made a tour of inspection in the West. That section he said was in a healthy economic conditions; the farmers were as contented as farmers could be; they had paid off most of the mortgages on their land, had luxuries, and were enjoying the cumulative benefits of three years of good crops. He said that Canada was desirous of having what overflow there might be in population in the United States come to its western territory, and he pointed out that there were opportunities there and land was cheap.

He also said that in Canada there was a field for American manufacturers and emphasized the wealth of water power available in the Dominion. He cited developments that were under way, namely, that at Lake St. Johns, Quebec, where 1,400,000 horsepower were being developed. He said that American interests were building the largest aluminum works in the world there, where 3,000 persons would be employed and where there would be a capital investment of $100,000,000. Immigration, he said, had reached the pre-war level and was expected to become greater.

New Construction and Equipment

There has not been a great deal of new construction during the year. Work is proceeding on completing the Hudson Bay Railway which has been demanded by Prairie interests anxious for a short rail haul for export grain—this in spite of the fact that many observers have expressed the opinion that the route will not be worth much, since the bay will be blocked by ice during the period of the heaviest Canadian grain movement.

The Canadian roads greatly increased their purchases of new equipment in 1926 over the year previous. Locomotive orders totaled 61 as against only 10 in the preceding year; 236 passenger cars were ordered compared with 50 in 1925; and 1926 orders for freight cars reached a total of 1,495, as compared with 642 in the year preceding.

The roads are continually carrying on branch line construction, several hundred miles being completed during 1926. In addition the Canadian National standardized the gage of 143 miles of line on Prince Edward Island and improved terminal facilities and provided new structures at a number of points. The Canadian Pacific built a new $5,000,000 pier at Vancouver, B. C.; built a new hotel at Regina, Sask., at a cost of $2,000,000; added a wing to its hotel at Banff, Alta., at a similar cost; rebuilt burned sections of the Chateau Frontenac at Quebec City at a cost of $1,500,000; and undertook several important bridge renewals.

In sum it may be said that the Canadian roads with a prosperous year behind them are looking forward to an equally good if not better year in 1927. And their chances of enjoying it are good—provided they receive the proper treatment as to rates and are not pressed unduly by excessive wage increase demands.

A Reinforced Concrete Bridge in Chile

Electrified Section of Mexican Railway—Maltrata in Foreground—Orizaba Peak in Background

Situation in Mexico Unfavorable

Earnings inadequate, but rate increases impossible—Wage readjustment appears only solution

By W. Rodney Long

THE National Railways of Mexico, according to an agreement reached in New York on October 23, 1925, were returned to private owners on January 1, 1926. The system has been operated by the government since it was taken over by the Constitutionalist government on December 4, 1914. Under the new agreement, the entire net receipts of the National Railways were to be sent monthly by the executive president to the office of the international committee in New York. In the event that the receipts exceeded the payments due, the excess was to be used to retire some of the outstanding paper. It was estimated at that time that the railway debt amounted to 479,268,644 pesos as capital and 197,053,926 pesos as back interest. In February of 1926 the chairman of the board of directors of the railways, issued a statement which, among other things, showed the estimated receipts and disbursements for the year 1926. This statement is shown in the accompanying table:

Year 1926		Pesos
Probable monthly revenue, average		10,100,000.00
Disbursements:	Pesos	
Salaries and wages	6,000,000.00	
Materials:		
Petroleum	733,200.00	
Coal	154,000.00	
Ties	450,000.00	
Fuel and wood	160,000.00	
Other materials	500,000.00	
Paper	50,000.00	
	2,047,200.00	
Total disbursements		8,042,200.00
Net monthly surplus		1,952,800.00

Expected Earnings Fail to Materialize

For the month of January the gross receipts amounted to 12,000,000 pesos or approximately 2,000,000 pesos more than was estimated in the above table. However, reports indicate that since March the total receipts have shown a monthly decline, although the income is greater than in 1925. In June receipts amounted to 10,500,000

pesos and in July to 9,900,000 pesos. The reason for the increased receipts over the last year is not due to increased traffic but rather to the fact that the volume of passes and free service has been reduced since the return of the railways to private operation. The position of this railway appears from reports to have become steadily worse and it is very probable that the Mexican government will order some drastic changes.

Railway President Summarizes Situation

In connection with this idea is the statement appearing in the Mexico City press on November 18, 1926, of B. E. Hollaway, the executive president of the National Railways of Mexico, regarding the present position of the railways. This statement follows:

"The economic situation of the National Railways of Mexico, in spite of efforts which have been made to bring about its reorganization, is still far from permitting the company to meet its obligations.

"In the construction of the railway system, heavy sums of foreign money have been invested. This money was invested in Mexico in expectation of an entirely legitimate and justified return. Now the stock of the National Railways, excepting a small block of preferred stock on which a small dividend, less than the amount due, was paid during a short period some years ago, has not succeeded in producing any return whatsoever to its owners, and perhaps a long time will pass before it will be possible.

"Likewise the National Railways of Mexico have not been able to take care of the service of various contracted obligations, which obligations, both those referring to the return of the capital as well as to the payment of interest thereon, are subject to contractual-stipulations. The forced failure to comply with these obligations since 1914 has come to increase considerably the liabilities of the company.

"It will be seen clearly from the above that the present economic situation of the National Railways of Mexico does not permit this company to meet its obligations, and therefore, being prevented from carrying out the necessary reforms of the administration of the company, the federal government will be obliged to assume charge of the service of the general mortgage bonds of the National Railways and the first mortgage bonds of the Vera Cruz to Pacific railway, which the government in the first instance guaranteed. This would be equivalent, in the last instance, to putting on the backs of the taxpayers the unjust weight of obligations of a private commercial company.

"It is then absolutely indispensable to proceed to the reorganization of the services of the company, in order that it be in position to meet its own obligations and prevent other groups less favored than those employed by it, from having to support a burden which should not be theirs.

Rates Cannot Be Raised

"It should be stated that the tariffs of the National Railways have been raised to a point where it is impossible to increase them, since, if they were increased, there would be a reduction in the amount of traffic, as the articles affected would not support a new increase. As a consequence, there would be a decline in the revenues of the railways, and the economic life of the country would be hard hit by the increased cost of transportation.

"Therefore, in order to prevent that the mass of the Mexican people should suffer an increase of tax in order to maintain the National Railways, this company has resolved to call on the patriotism and loyalty of its employees, in order to proceed to a readjustment of personnel and wages which will permit the company to maintain itself from its own resources.

"To the above must be added the expenses required by the maintenance of the way and the reparation of equipment destroyed by the rains which have been exceptionally heavy this year. In order to make the National Railways solvent, it is necessary that they be operated with an operating ratio not exceeding 80 per cent, or, if possible, slightly less; that is, that there be available at least 20 per cent of the revenues to meet the payment of inescapable contractual obligations—all this without even taking into consideration a minimum dividend on stock.

"Up to 1913, the National Railways were operated with a ratio of a little more than 60 per cent, and even after the revolution the ratio remained more or less acceptable up to 1921, when it rose to such a point that notwithstanding the increases in the tariffs, it was not possible to reduce it materially. As the operating ratio reached 91½ per cent in 1925, it is now absolutely necessary to bring it down not to exceed 80 per cent, to which end it is necessary to reduce the expenses of every department of the railways to a reasonable average. . . .

Wage Readjustment Only Recourse

"In view of the above, the company has decided to call on the labor unions including the railway personnel, to discuss the labor contracts with the company, with the understanding that the legitimate interests of the workers will be respected, as the company itself is, above all, interested in the personal welfare of the laborers. The company is sure that it counts on the frank co-operation of the employees, in order to solve the serious problem which confronts it,—a problem of transcendent importance, not only for the company but also for the entire country, whose welfare is closely bound up with the fate of the principal transportation system."

New Construction

During the year, work was resumed on the short line connecting Tampico with Mexico City. The line, when completed, will reduce the length of time required to travel between these two cities via San Luis Potosi by approximately one-half. As of September 2, the line out of Tampico was in operation as far as Kilometer 19, where the main camp is situated, with the engineers' camp at Kilometer 21. These camps are soon to be moved further along the proposed route. Enough ties for ten miles of trackage, or approximately 30,000, are understood to be on their way from the United States. The right-of-way is graded as far as Kilometer 49, and is being pushed to Guadalupe. The direction which the road will take from that point has not yet been definitely determined, there being two alternative routes,—one via Zanetepac and the other via Tuxpan.

A concession to construct a railway from a point on the Monterey-Tampico line near Kocotencatl, to the station of Quinientos, via Valles and Nicos, states the Boletin Financiero of August 17, was asked of the Secretary of Communications and Public Works by the management of the National Railways of Mexico.

The construction of a railway from a point on the Southern Pacific line in the region of the Rio Mayo to the port of Yavaros, a distance of 80 kilometers, has been proposed by an American company.

A line from Ajuno on the National Railway to Tacambaro, Michoacan, and later to Huetamo has also been mentioned.

The connecting link between Tepic, Nayarit and Guadalupe on the Southern Pacific will be completed and opened to freight traffic in December, 1926, and through passenger service will be inaugurated in January, 1927. Construction commenced on the work in 1923. Between Tepic and La Quemada more than thirty tunnels have had to be bored, more than forty bridges to be built, at a cost of more than $12,000,000. The physical difficulties encountered in this steep mountainous ascent have required exceptional engineering ability. The expense has been correspondingly great—about $120,000 per mile. Already the Wells Fargo Express Company has established a through express service to Mexico City over this route. The parcels are transferred at Tepic and carried across the gap on mule back. At present the maximum weight of packages accepted for this through express service is 50 kilos (roughly 100 lb.) while the size is limited to a meter in length.

Construction work on a branch of the El Oro Mining & Railway Co.'s railway is progressing rapidly. The line is being extended into a recently acquired timber tract and will be used to haul cut timber and supplies.

The Secretary of Communications and Public Works announced on October 11, that he had approved the plans presented by the management of the National Railways for completing the branch line between Saltillo and the Hacienda of Porosi in Nuevo Leon.

Labor Conditions

The labor situation in Mexico has been very disturbed all during the year. A commission of workmen representing the Confederation of Railway Unions held a conference with B. E. Holloway, executive president of the National Railways, on February 4. According to Excelsior of February 5, the commission threatened to call a general strike of all railway employees if new labor regulations were put into effect. However, Mr. Holloway is said to have informed the commission that nothing definite had been done in the way of adopting such regulations, and that no changes in personnel or wages were anticipated. The commission was said to be entirely satisfied with the interview. In July the Confederation of Railway Unions threatened to bring about a general strike on the railway systems, in support of the strike on the Isthmus of Tehuantepec Railway, but the strike did not materialize.

It has been reported that the reason for the walk-out on the Isthmus Railway was a demand for the discharge of an inspector hostile to the striking unions. Some hold the view that back of this demand is the rivalry of the Confederation of Railway Unions (an independent brotherhood) with other railway employees organizations affiliated with the Mexican Federation of Labor. During November announcement was made that the National Railways planned to reduce personnel and wages in order to make the system self supporting and able to pay debts without resort to government guarantee. Railway officers called on the labor groups for co-operation, but its proposals were not accepted by the unions which it is said, claimed that the bad financial condition is due primarily to salaries of higher officers and to unfavorable contracts for purchase of materials.

Market for Railway Equipment

There continues to be at present almost no foreign competition on railway equipment. Practically all of the equipment, even on the British-owned and operated Mexican Railway, is purchased in the United States. In most instances, all the sales for the National Railways are consummated through the representative of one of the American Locomotive builders. This is due to the fact that the company has made an arrangement to sell to the government on credit. The Southern Pacific buys its equipment through its main office located at Tucson, Arizona. The other railways are all closely in touch with the leading manufacturers of equipment in the United States and generally buy direct.

Reduction in Freight Rates

One of the first acts under the new administration was the reduction of freight rates on the National Railways. The new schedule unifies some twenty different schedules formerly in use and, among other provisions contains the following of importance to commerce:

(a) A reduction of 50 per cent in the regular rates established by the new schedule, applicable to shipments of national products to be exported through Ciudad Juarez, Piedras Negras, Nuevo Laredo, Matamoros, Tampico, Manzanillo, Suchiate, Puerto Mexico, Salina Cruz, or Vera Cruz, providing such products are shipped at least 400 kilometers on lines of the National Railways.

(b) A 20 per cent reduction in the regular rates is allowed for shipments of articles for national consumption, made on any of the National Railways' trunk lines connecting Mexico City with Ciudad Juarez, Piedras Negras, Nuevo Laredo, Matamoros, Suchiate, Salina Cruz or Puerto Mexico, providing such shipments are for more than 600 kilometers; the same reduction is allowed for shipments to Vera Cruz on either of the Interocean Railways lines, via Oriental or Puebla, providing they are for more than 200 kilometers.

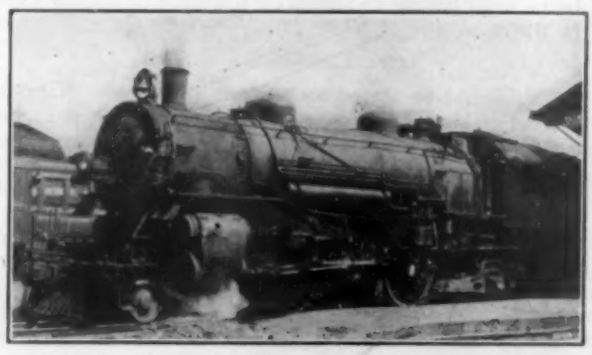
On June 30 the 30 and 20 per cent surcharges that were put into effect on railway freight handled by the National lines during the De la Huerta revolution were abolished. The 15 per cent surcharge still remains.

Recently it was stated that arrangements had been completed with various American railways for the establishment of direct freight services between points in the United States and Mexico City, thus eliminating trans-shipments and customs inspection at border points. Although the plans were said to have been completed, it appears from this report that such service is not to be initiated until about the first of the year.

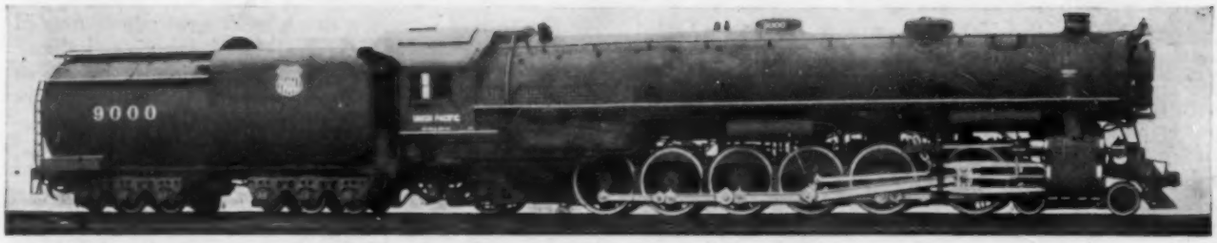
Telephone Train Dispatching

The National Railways have decided to substitute telephones for telegraphic service for the dispatching of trains. The first 236 kilometers of the line, from Cardenes to Dona Cecelia, are now provided with this system, and it is said to be the intention of the company to continue the work of installation as rapidly as possible.

* * * *



An Erie Pacific in Suburban Service, Jersey City, N. J.



The "Union Pacific" Type, Built for the First Time in 1926—A Three-Cylinder Locomotive Built by the American Locomotive Company

An Era of Intensive Locomotive Development

Interest in roller bearings for passenger cars increasing—
Program of freight car standardization continues

By C. B. Peck
Mechanical Department Editor, *Railway Age*

A MARKED willingness to give consideration to a wide departure from conventional ideas of locomotive design has been shown by practical railroad men and locomotive designers for several years. This attitude—new since the World War—seems not to have diminished during 1926; witness, the three-cylinder 4-12-2 type locomotive built by the American Locomotive Company for the Union Pacific, the Baldwin three-cylinder compound high-pressure locomotive No. 60,000 which was exhibited at Atlantic City during the A. R. A. conventions last June and the Northern Pacific 4-8-4 type, the first of which has just been completed by the American Locomotive Company.

In the Union Pacific locomotive a step outside the beaten path has been taken in utilizing a six-coupled driving wheel base. In doing this, advantage has been taken of the distribution of driving stresses among three cylinders and main rods and among three main crank pins on two axles, thereby securing a unit of unusually large capacity for a non-articulated locomotive. This locomotive, which has practically the same tractive force as the Mallet locomotives in service on the Union Pacific, is said to have produced 80 per cent more ton-miles per train-hour than the Mallet locomotives, burning slightly less than half the fuel per 1,000 gross ton-miles that is required by the Mallet type, over a territory of 0.8 per cent ruling grades. This is the result of increased horsepower capacity and over-all thermal efficiency.

Baldwin High Pressure Test Data

The Baldwin locomotive No. 60,000, a 4-10-2 type, is of unusual interest because of its working pressure of 350 lb. and its use of the double expansion principle in a three-cylinder arrangement. The firebox of this locomotive is of the modified Brotan water tube type, with 82 sq. ft. of grate area and a portion of the firebox set off by a fire wall to form a combustion chamber.

No data from road experience with this locomotive are yet available. It has been tested on the Pennsylvania test plant at Altoona, Pa., however, and some interesting preliminary data from these tests were presented by Lawford H. Fry at the session of the Railroad Division of the American Society of Mechanical Engineers during the annual meeting of the society in December. The boiler developed the large equivalent evaporation of 85,000 lb. per hour, with a dry coal consumption of 11,900 lb. per hour, at a boiler efficiency of about 52 per cent. In two tests the engine indicated 4,500 hp., at which the capacity of the test plant had been reached; the water rate is unusually uniform for all horsepowers

This Locomotive Is Decorated with the Emblem of the Train It Hauls—The Tank, the Cab, the Sandbox, Dome and Turret Casings, the Feedwater Heater Drum, the Headlight Case, the Cylinder Jackets and the Wheels Are Painted Green—The Striping Is in Gold Leaf and the Unpainted Metal Parts Are Polished—The Boiler Jacket Is Black

between 1,500 and 4,500 and seems to be little affected by variations in speed or cut-off. At speeds from 15 to 37.5 m.p.h. and cut-offs from 50 to 80 per cent in the high-pressure cylinder, the steam per indicated horsepower-hour varied from 14.2 lb. to 15.4 lb. With the full gear cut-off of 90 per cent in the high-pressure cylinder, the water rate was 16.5 lb. at 15 miles an hour and 16.6 lb. at 22.5 miles an hour. A low and remarkably narrow range of coal consumption per indicated horsepower-hour is evident from the 1.9 lb. used at low power outputs up to the 2.7 lb. at 4,500 hp.

The boiler efficiency of this locomotive, with its range from 52 per cent at a boiler output of 85,000 lb. equivalent evaporation per hour to 70 per cent at outputs of approximately 30,000 lb. per hour, is not unusual. The low steam and coal consumption per indicated horsepower-hour, therefore, is evidence of the value of the increased boiler pressure, which makes possible the conversion into work of a larger proportion of the total amount of heat in each pound of steam than is possible with a working pressure of 200 lb.

The credit for pioneering the use of high-pressure steam in America must be given to John Muhlfeld whose ideas for the utilization of a high working pressure were embodied in the "Horatio Allen" of the Delaware & Hudson, which went into service about two years ago. Like the Baldwin locomotive, the "Horatio Allen" embodied the use of a water tube type of firebox, a boiler pressure of 350 lb. and compound cylinders. Mr. Muhlfeld, however, used the cross-compound principle, whereas the Baldwin locomotive embodies a three-cylinder arrangement in which all three cylinders have the same bore and stroke. The most apparent advantages of the latter arrangement are the reduction in cylinder clearance dimensions and a better balancing of the back pressure loads on pistons, rods and driving boxes. It involves additional mechanism, however.

Future of High Steam Pressures

How extensive the ultimate use of boiler pressures of 350 lb. or more is likely to be in America is a question for the answer to which much more evidence is needed than is yet available. Several facts, however, indicate that the most pressing physical limitations to the use of high pressures are rapidly disappearing, and a pressure of 400 lb. has already been adopted in one case. A second locomotive generally similar to the "Horatio Allen," carrying 400 lb. pressure, will probably be completed for the Delaware & Hudson soon after the first of the year.

There are several limitations to the pressure which can be carried in the conventional type of locomotive boiler. The first of these is the flat sheet stayed type of firebox. With the carbon steel used in firebox construction, pressures above 250 lb. are generally considered impracticable. This limitation has been removed by the water tube firebox, of which there are three types in this country— the McClellon on the New York, New Haven & Hartford, the "Horatio Allen" on the Delaware & Hudson, and that of the Baldwin locomotive. The next limitation is the shell of the barrel type fire-

Wabash Automobile Car Built by American Car & Foundry Company—This Car Has 11-ft. Side Door Openings

tube boiler, the weight of which increases rapidly with increases in pressure. Furthermore, as the thickness of the sheets increases much beyond that required in a large boiler to carry 250 lb. working pressure, a point is reached beyond which the fabrication of the boiler shell becomes more a job for the machine shop than for the boiler shop, and the cost is largely increased. In the case of the "Horatio Allen," this limitation has been removed, or at least extended, by reducing the diameter of the barrel of the boiler to a mere container of fire tubes, the steam space being contained in the upper drums of the water tube firebox, although additional weight and cost are involved in the construction of the firebox.

That there are possibilities for the extension of these limitations by the use of special steels is also becoming apparent. The Canadian Pacific has received a number of locomotives of the Pacific and Mikado types during the latter part of 1926, employing a nickel alloy steel for the firebox and shell plates and staybolts. Advantage has been taken of the increased tensile strength of this material to increase the boiler pressure from 200

lb. to 250 lb., with no increase in the thickness of the plates or diameter of the staybolts and, therefore, with no increase in weight.

Reference was made in these columns last year to a German locomotive with two working pressure stages, the first of about 850 lb. and the second of 200 lb., with an additional closed stage for the transfer of heat from the firebox to the 850-lb. working stage, which operates at a pressure of 1,200 lb. In this case the use of the fire-tube shell for the generation of the 200 lb. steam removes it as a factor in the high-pressure problem, which is confined to the water-tube firebox.

It is evident, therefore, that several methods of attacking the practical application of high boiler pressures have already been developed, without having yet tried out the possibilities of a complete locomotive boiler of the water-tube type. There would seem to be little doubt of the ultimate commercial practicability of much higher pressures than are now established practice.

Diesel Locomotives

So far as developments in design are concerned, the status of the application of the Diesel engine to the locomotive is little changed from that of a year ago. The interest in this type of prime mover in the United States is largely inspired by the desire for a smokeless, self-contained motive power unit. It has not yet received a great deal of consideration as a substitute for the steam locomotive, except under special conditions, largely in yard service. The New York Central is practically the only steam railroad which has so far definitely undertaken the use of Diesel locomotives in road service. In this case the demand for smokeless operation and the undesirability of complete electrification on this suburban branch line have been the controlling factors in the selection of the Diesel locomotive. The development of the Diesel engine in light, high-speed units large enough to compete with the steam locomotive for general road service in America has not yet been effected.

The Trend of European Developments

In the European developments with respect to Diesel locomotives, the emphasis has been more on the possibilities for the utmost in fuel economy than on the desire for smokeless operation. For this reason considerable experimental work has been done with transmissions of other forms than electric in an effort to miss no opportunity for the highest possible over-all thermal efficiency.

Several forms of hydraulic transmissions have been developed and tried out. So far, however, none of them can be said to have passed the development stage and there is considerable doubt as to whether they will do so.

The possibility of working out a practicable mechanical transmission for high horsepowers is receiving attention. Such a transmission, involving the use of electromagnetic clutches, has been incorporated in a 4-10-2 type Diesel locomotive built early in 1926 by the Hohenzollern Locomotive Works, Duesseldorf, Germany, the clutches being designed by the Magnet-Werk, Eisenach, Germany. This transmission is required to handle 1,200 brake horsepower. The locomotive, which has been in trial operation for some time, has demonstrated the high over-all efficiency of the mechanical transmission at road operating speeds, but the transmission, while promising, must still be considered in the development stage.

Active interest in locomotive development in Europe is at present swinging from the Diesel locomotive to the use of steam in the form of high-pressure reciprocating locomotives or turbine locomotives. It is reported that a 2,500 hp. locomotive is being developed in Germany to carry a boiler pressure of 1,500 lb., the steam to be expanded in one high-pressure and two low-pressure cylinders, and reheated between the two stages. Several types of turbine locomotives have been built during the past few years, some of them only within the past year. These locomotives operate condensing and are of considerably less capacity than would be required for general service in America. The problem of designing a condenser of sufficient capacity to handle the quantity of heat which must be transferred in locomotives developing 3,000 to 4,000 hp. has not yet been solved.

Great Northern Oil-Electric Locomotive, Built by the Ingersoll-Rand, General Electric and American Locomotive Companies

Weight	216,000 lb.	Capacity (two engines)	600 hp.
Tractive force:		Speed	
Starting	60,000 lb.	One-hour rating	5.3 m.p.h.
One-hour rating	25,000 lb.	Maximum	30 m.p.h.

The Immediate Future

We have now contemplated the background of the picture of improved motive power possibilities, in which the perspective is too distant to permit more than sketchy, suggestive outlines. It is not well to turn away from the picture without considering the objects in the fore-

ground, which, in reality, have most to do with its character and significance.

What are the motive power designs which hold the greatest potentialities for increases in locomotive capacity and increases in operating economy in the immediate future? These are the improvements in the locomotive which are not new this year, but which have passed through their periods of development and the effects of which have been evaluated in actual service operation.

Northern Pacific Observation-Club Car, Typical of the Trend Toward Individuality and Harmony in the Treatment of Interior Decorations

One is the large grate area and limited cut-off combination which forms the essential features of the design commonly known as the Lima A1 locomotive. This combination, with other important details, among them the four-wheel trailer and the articulated main rod drive, has proved to be an effective means of developing an intensive power output at high efficiency from a locomotive with a given driving wheelbase.

Another is the three-cylinder development which has increased the capacity limitations of a single driving wheelbase and has intensified the power output which can be obtained from a given wheelbase. The field for the feedwater heater, the exhaust steam injector and the Thermic syphon has not yet been exhausted, neither has that of the booster and auxiliary locomotive. Cast steel cylinders have only begun to make their influence felt as a means of reducing weight and making it available for use in the boiler where it will increase locomotive capacity.

These are all outstanding factors which are no longer awaiting development; they are the means at hand, not yet so extensively used but that they can be further applied with the assurance of immediate improvements in train loads, train speeds and fuel economy.

Passenger Car Developments

Interest in the roller bearing for use on passenger car journals has greatly increased during the past year. The Pennsylvania has had a number of passenger cars equipped with such bearings for several years and the number of cars so equipped has been materially increased during 1926. The Chicago, Milwaukee & St. Paul will have 127 cars, including 64 Pullmans equipped with such bearings within the next few months.

Experimental installations of several types of bearings have now been in service long enough to demonstrate clearly that such bearings can be made mechanically reliable and to indicate that their use will probably effect a material saving in maintenance and servicing costs as well as a material reduction in starting resistance and a somewhat smaller reduction in running resistance within the range of passenger train speeds. With the constant demand for increasingly heavy passenger trains, a reduction in the starting resistance has an important bearing on the capacity of the locomotive, which is to a large extent limited to the number of cars it can start and accelerate rapidly enough to maintain required schedules.

The possibilities for the use of structural metals considerably lighter than steel in building passenger cars have begun to receive consideration in America. The advantages of such materials, if they can be produced commercially with satisfactory physical properties, will be tremendous. Comparing the weights per passenger carrying capacity of American equipment with that of most countries in Europe, it will be found that the weight of American equipment exceeds that of European equipment to a marked degree—as much as 100 per cent in some cases. A material reduction in these weights, even though at a considerably increased cost, will be justified in the reduction in the cost of conducting a branch of railway service which must be maintained to a high degree of efficiency, although it produces a very meagre margin of revenue above its out-of-pocket cost.

The Baldwin Three-Cylinder Compound with Water Tube Firebox, Carrying 350 lb. Working Pressure

Most of the recent interest in passenger equipment has had to do more with its interior and exterior finish than with structural design. Beauty and harmony of color and decorations have become a definite objective in the interior finish of passenger cars on many railroads during the past two years, and a realization that the value of beauty is enhanced, if it appears in varied forms, is spreading rapidly.

The tendency toward the attainment of attractiveness,

however, has not stopped with the interior of passenger equipment. Several railroads are using color in the exterior finish of their locomotives. No doubt most railroads will continue to adhere to black as the most practicable color for use on locomotives, but it must be conceded that the use of other colors in pleasing combinations has a certain value in attracting favorable attention to the railroad by the public which it serves—at least while the paint is new. Perhaps the same favorable attention might be attracted in some cases by the mere expedient of cleaning and polishing the conventional black.

The Use of Lacquers

While the lacquer finishes have not yet extensively superseded the use of oil paints and varnishes for the exterior finish of passenger cars and locomotives, the rapidity with which they can be applied and their durability has attracted widespread attention of master painters and other railroad officers. These lacquers dry by the simple process of evaporation of highly volatile solvents, while paints and varnishes dry by a process of oxidization, which is relatively slow and which continues slowly until the protective film disintegrates. The lacquers, once dry, are chemically inert and present a hard and tough surface which is destroyed only by abrasion or errosion.

The possibility of reducing the time required for finishing the exterior of a passenger car by approximately half with lacquer suggests an increase in the service time of equipment and an increase in the capacity of a given investment in shop facilities. Many railroads are engaged in working out the special problems involved in handling these materials at the present time. Their extended use in the future is highly probable.

Freight Cars

The situation in the field of locomotive design and that in the field of freight car design present a striking contrast. Attention has been called to the marked tendency to depart from customary designs and proportions in designing motive power, which has assumed a variety of forms. In the case of freight cars, the railroads have exerted intensive efforts during the past few years in the development of a high degree of uniformity, narrowing the scope for variations within the smallest possible limits.

The conditions in the two spheres of activity are materially different. The problems of providing equipment suitable for universal use and of maintenance in interchange assume a far greater relative importance for freight cars than for locomotives, which do not have to meet universal requirements.

Even in the case of the freight car, however, probably no one would maintain that requirements are not changing. For instance, the automobile industry is asking for 12-ft. side door openings in automobile cars. Likewise, probably no one would maintain that further improvements in freight cars are not needed. The unsatisfactory situation with respect to springs under 70-ton cars is sufficient evidence that improvements in car trucks should be encouraged.

The most important problem of standardization is to prevent formal standards from discouraging the activity of the inventor and the designer; in other words, to prevent stagnation in a field where activity and progress are already needed and will be needed more in the future.

"Northern Pacific" (4-8-4) Type Passenger Locomotive Just Completed by American Locomotive Company, with Firebox 162 in. by 102 in. to Burn Lignite—Tractive Force, Including Booster, 70,000 lb.

No new standard car designs have been adopted during the past year. The Committee on Car Construction at the Atlantic City convention of the Mechanical Division in June, however, asked for authority to proceed with proposed standard automobile car designs and a standard self-clearing hopper car. As a result of the recent letter ballot, the committee is authorized to proceed with the design of 40 and 50-ton automobile cars for unrestricted interchange, with an inside height of 9 ft. 3 in. and an inside width of 8 ft. 7¾ in. The question of preparing a standard design for restricted interchange, with an inside width of 9 ft. 2 in. and an inside height of 10 ft., and whether the door width shall be 10 ft. or 12 ft. on both the unrestricted or restricted clearance cars was not conclusively settled either way by the letter ballot. The result of the letter ballot on the height of the hopper cars was also inconclusive and a further letter ballot will be required before the committee can proceed with the preparation of this design.

A Virginian 637-Ton Locomotive and a 2-Ton Mine Locomotive

Electric Traction Activities in 1926

Electrification of 276 miles of track completed—Work in progress on 328 miles

By Alfred G. Oehler
Electrical Department Editor, *Railway Age*

PRACTICALLY all electric traction activities during 1926 have been limited to the making of extensions to existing electrified sections and to the purchase of new cars and locomotives. No entirely new project was announced but in no preceding year has there been greater or more diversified activity.

Pennsylvania Railroad

The Pennsylvania in 1926 started electrifying its line between Philadelphia, Pa., and Wilmington, Del., and between Philadelphia and West Chester, Pa., via Media. This will include 150 miles of track and is an integral feature of the development of the new passenger station project on the west bank of the Schuylkill river and the subway extension and subway station for suburban traffic at Fifteenth street and Parkway, Philadelphia. Motors and control equipment for 156 single-phase, multiple-unit cars have been ordered, 121 equipments from the Westinghouse Electric & Manufacturing Company, 30 from the General Electric Company and 5 from the American Brown-Boveri Electric Corporation.

The Pennsylvania in 1924 built at its Altoona, Pa., shops three electric locomotives with a 2-8-2 wheel arrangement weighing 388,000 lb. These, known as the L-5 type, can be used in either freight or passenger service by changing the driving gears and will operate from an 11,000-volt, a.c., overhead trolley or a 600-volt d.c. third rail, depending on the control equipment installed. During 1926 twenty-one more of this type of locomotive were ordered, 17 to be built in the railroad company's shop and four by the Baldwin Locomotive Company. The electrical equipment for seven of these locomotives will be supplied by the American Brown-Boveri Electric Corporation, four by the General Electric Company and ten by the Westinghouse Electric & Manufacturing Company. Two Pennsylvania-Westinghouse, 150-ton electric switching locomotives with 0-6+6-0 wheel arrangement were also ordered in 1926. These are similar to six locomotives delivered in 1926, and are also adaptable to a.c. and d.c. service.

An aluminum alloy pantograph was developed which was installed on the type FF-1 Pennsylvania locomotive. This is similar to those used on the Virginian. The usual steel tubing and malleable iron castings weigh 1,160 pounds; the design in aluminum alloy weighs 760 pounds.

Great Northern

The original Great Northern electrification was installed in 1909 through a tunnel in the Cascade mountains in Washington for the purpose of eliminating gas and smoke. The tunnel, constructed on a 1.7 per cent grade, is 2¾ miles long. Three-phase, 6600-volt locomotives were used.

Late in 1924 announcement was made that the line from Wenatchee, Wash., to Skykomish, Wash., a distance of about 80 miles, would be electrified, and the three-phase trolleys would be replaced by a single-phase

One of the Great Northern Motor-Generator Type Locomotives

trolley. Up to the present time work has been confined to the 24-mile section from Skykomish eastward through the tunnel.

A decision was also reached to build a new tunnel 7¾ miles long. Work on this was started the early part of 1926 and when the tunnel is complete it will shorten the line 7.67 miles, eliminate snow sheds, curves and the old tunnel and will effect a reduction in grade.

Two locomotives were ordered in 1926 from the General Electric Company and two in 1925 from the Westinghouse Electric & Manufacturing Company. All of these are motor generator locomotives receiving power at 11,000-volts a.c. and using d.c. motors, and all are designed for regenerative braking. The Westinghouse locomotives, which have been delivered, weigh 715,000 lb. and consist of two units each having a 2-8-2 wheel arrangement. The General Electric locomotives will weigh about 510,000 lb. and will have a 2-6+6-2 wheel arrangement.

New York Central

During 1926 a new electrified section of the New York Central was opened on the Putnam division between Sedgwick Ave. station, New York City, and Yonkers, N. Y., a distance of seven miles, using multiple-unit cars which are duplicates of those operated on the terminal division.

To supplement the motive power for passenger work, ten 130-ton gearless locomotives, similar to those which have been in service since 1916, were placed in operation the latter part of 1926. Freight and switching locomotives which have been under construction since the fall of 1925, in preparation for the electrification of the West Side tracks in New York City, were also placed in service during 1926. These include two freight locomotives weighing 170 tons each and seven switching units each weighing 100 tons.

The increased power demands for traction work in the electric zone have required additional substation equipment at several points. This new power has been obtained by the installation of new automatic substations midway between the older stations and by additional units in the existing manually controlled substations. Three automatic substations are now in operation and three more will be completed some time in 1927. Two existing manually operated substations are each being equipped with a 4000-kw. rotary converter and two others with a 2500-kw. converter. The power supply will be augmented by the installation of a 20,000-kw. turbine-generator set at the Glenwood power station. Locomotives and electric power apparatus were supplied by the General Electric Company.

New York, New Haven & Hartford

Increasing business on the New York, New Haven & Hartford, particularly in the electric zone, has required new equipment, part of which was under construction a year ago. During 1926 five 180-ton passenger locomotives with commutating type motors and three 86-ton switchers with commutating type motors were ordered. These will have Westinghouse equipment. The passenger locomotives are similar to 12 others in service and have a 2-6-2+2-6-2 wheel arrangement. The switchers have two, four-wheel articulated trucks and are similar to three others now under construction and 16 of the same general type which have been in service since 1912.

Five motor-generator type freight locomotives weighing 140 tons each, built by the General Eletcric Company, were placed in service during 1926 and two switching locomotives weighing 100 tons each have just been delivered.

Twelve multiple unit motor cars and 15 multiple unit trailers have been ordered.

To supply requirements for additional power the New Haven has arranged for the construction of a new substation at Devon, Conn., which will contain two 5000-kw. variable-ratio frequency changer sets; power will be purchased from the Connecticut Company to supply the New Haven end of the electrified zone. These sets are known as the Sherbius control type and are particularly adaptable to this service, supplying a flexible link be-

A 106-Ton, Motor-Generator Type Switching Locomotive Built for the New York, New Haven & Hartford

tween systems of different frequencies rather than the rigid link which is unavoidable with frequency changer sets of the usual type.

Illinois Central

The electrification of the Illinois Central suburban passenger lines in Chicago, Ill., was completed in July, 1926. This is the latest of the big electrification installations to go into service. The electrified section includes 106.2 miles of suburban main tracks and 16.3 miles of yard storage tracks. At present about 87,000 passengers are handled every week day on 418 trains. There are 260 multiple-unit cars for this service consisting of 130 two-car units made up of a motor car and trailer semi-permanently coupled together for operation at 1500 volts d.c. from an overhead contact system.

A part of the power is supplied through mercury arc rectifiers. This is the first installation of the kind in this country. Many special protective features are included in the design of the power feeder circuits.

Virginian Railway

Electric operation on the Virginian was inaugurated in September, 1925, between Mullens and Clarks Gap, W. Va., a distance of about 14 miles on a 2.07 per cent grade. The electrification was completed in September, 1926, and trains are now hauled electrically from Mullens to Roanoke, Va., a distance of 133 miles. From Mullens 6000-ton trains are taken up the 2.07 per cent grade to Clarks Gap at 14 miles an hour by one locomotive at the head and one at the rear of the train. This requires an output of 12,000 hp. from the two locomotives while running at normal speed and a greater output at starting. After passing the summit the pusher is cut off. The train is filled out to 9000 tons and taken to Roanoke, 119 miles, with one locomotive over grades which reach 0.6 per cent ascending and 1.5 per cent descending. This involves starting a 9000-ton train on a 0.6 per cent grade and holding it on a 1.5 per cent grade at 15 m.p.h. by regenerative braking. Ten 3-unit road locomotives and 6 single-unit switchers are used.

A "Frameless-Truck" Type Locomotive Used in the Wallabout, Brooklyn, N. Y., Terminal of the Delaware, Lackawanna & Western

Various factors have combined to produce exceptionally heavy traffic on the Virginian since electric operation was completed to Roanoke. The electrification was laid out to handle 11,000,000 gross tons per year eastbound. In recent months the Virginian has been delivering practically one-third of all the coal dumped at Hampton Roads, and it is a common occurrence to handle a daily tonnage 50 per cent in excess of the estimated average requirements. The electrification was planned to handle a maximum day of 60 per cent above the average. As a matter of fact, on the maximum day so far encountered, the tonnage handled was 150 per cent greater than the average.

One day in October of this year 1,150 cars were taken up Clarks Gap hill, or 60 per cent more than the maximum with steam. This included two steam trains because all of the electric locomotives were in service. The figures, however, give some indication of the increased track capacity resulting from electrification.

Some months ago an accident to a steam train blocked the Clark's Gap hill for a day. Meanwhile the Elmore yard became completely filled with eastbound loads. As soon as the line was re-opened the electric locomotives were given the task of clearing up the congestion. In 19 hours six electric locomotives handled 898 cars up the 15-mile, 2 per cent grade and emptied the yard. The best record with steam operation was 650 cars handled by 24 locomotives in 24 hours. In other words, the electric locomotive handled 7 times as many cars per engine-hour as had previously been handled by steam under similar emergency conditions.

The results so far on the Virginian indicate that its electrification is a success financially, no less than from an engineering standpoint. On the occasion of beginning complete electric operation, C. H. Hix, president of the railroad made the following statement: "Our experience with the electric operation between Elmore and Princeton has proved the wisdom of the expenditure, the first eight months' operation on a gross ton-mile basis showing 46 per cent decrease in cost in favor of electric operation over steam."

Long Island Railroad

Electrification of the Bay Ridge freight division of the Long Island is nearing completion and probably will be finished before the middle of 1927. A total of about 100 miles of track are included. The single-phase, high-voltage, a.c. locomotives which will be used have already been delivered.

In October, 1926, the electrification of the West Hempstead passenger branch was completed. This includes 7 miles of line and 14 miles of track. Sixty multiple unit motor cars and 30 multiple unit trailer cars were ordered to meet increasing passenger traffic requirements.

Eight electric locomotives were ordered and delivered. Seven of these are 150-ton a.c. locomotives having an 0-6-0+0-6-0 wheel arrangement, for the Bay Ridge freight division. These were built in the shops of the Pennsylvania and are Westinghouse equipped. The eighth locomotive is a combination third rail and storage battery type. It is a Baldwin-Westinghouse product,

A 100-Ton, 600-Volt, Direct Current Switching Locomotive Built for the New York Central

having an 0-4-0 wheel arrangement and weighing 25 tons. The battery is charged when connected to the third rail and cut out automatically when the charge is complete. The motors are connected to the line or the battery automatically so that the locomotive may be operated beyond the limits of the third rail.

Chicago & North Western

The Chicago & North Western has made a venture into the electric traction field by experimenting with a storage battery locomotive having an auxiliary gas-electric generating set. The locomotive complete weighs 237,000 lb. and is capable of exerting a tractive force of 66,000 lb. It is provided with a storage battery of sufficient size to handle a normal switching service during the day. At night it is expected that the battery will be recharged from power company supply, but if the amount of work done is too great to permit this, the battery charge can be maintained by the gas-engine-driven generator on the locomotive.

Delaware, Lackawanna & Western

There have been some interesting developments in catenary construction in connection with the electrification of the Wallabout terminal of the Lackawanna in Brooklyn, N. Y. The yard is an example of direct suspension for catenary and is an innovation in that it is arranged with springs for flexibility under ice or cold

weather conditions. This flexibility was necessary to permit low tensions in the construction. These in turn were required because of the poor holding power of the soil, the poles being installed without backguys. Coil springs connected with the contact wires and cross catenary supports elongate under winter loads allowing the whole system to sag, and return again when the loads are removed. The current collectors used are single shoe pantographs. The supporting poles are hollowspun concrete.

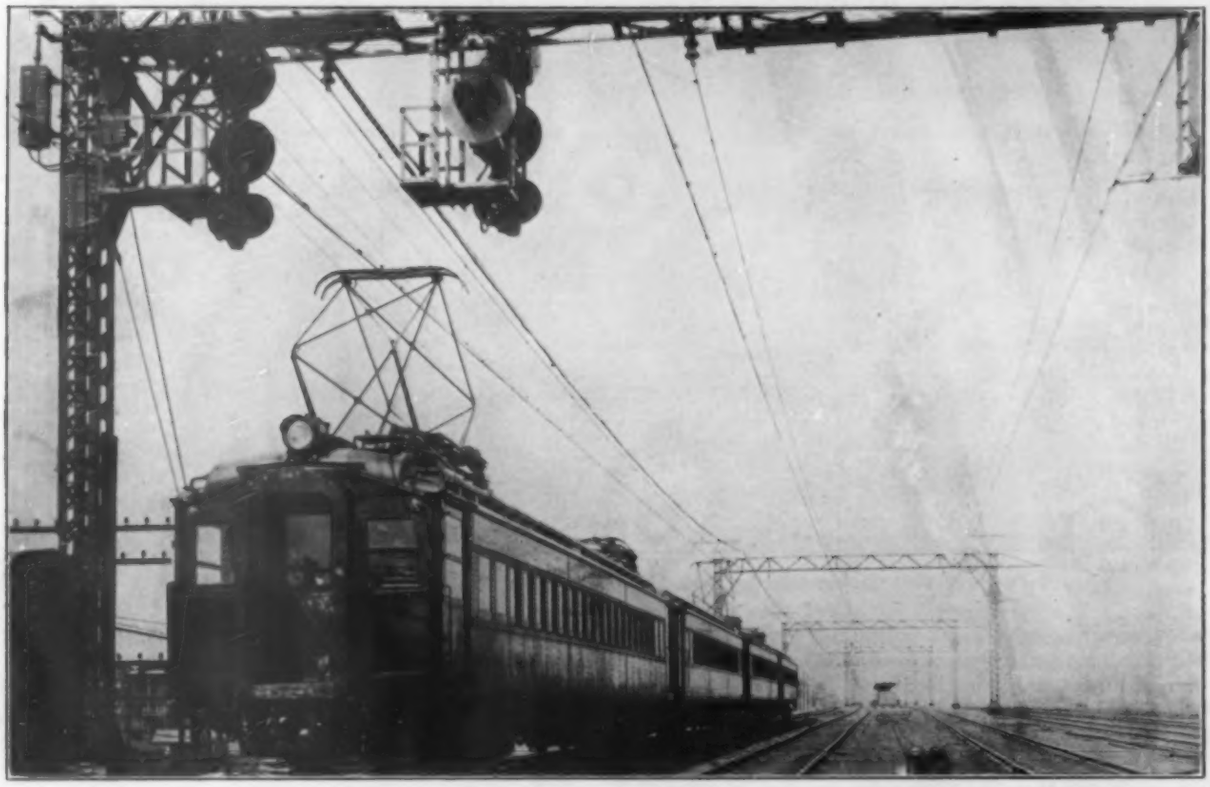
Other Equipment Orders

The Baltimore & Ohio has ordered two 0-4+4-0, 120-ton, 600-volt, direct current, freight locomotives. The Grand Trunk has ordered two 66-ton, 3,300-volt, alternating-current locomotives. The New York, Westchester & Boston ordered twenty 66-ton, 72-foot, 11,000-volt alternating current, multiple unit cars. All of these locomotives and cars are practically duplicates of others that have been in service on these roads for a long time.

Articulated Cars

Development of articulated cars has been limited to use on subway and on light urban and suburban equipment. The Brooklyn-Manhattan Transit Corporation after trying out three-car articulated units designed for heavy subway and elevated service has installed 67 of these units, equipped with General Electric motors and control. Each of the units is 137 feet long and consists of three car bodies mounted on four trucks. Each three-section unit will seat 160 passengers and a four-unit train will handle 2,000 passengers in one load.

About 190 rail cars and 16 oil and gas engine driven locomotives were ordered during 1926 from American builders. The electric drive is particularly adaptable to the locomotive requirements; the engines have relatively small power compared to the total weight of the locomotive, but this disadvantage is rectified to a considerable extent because the electric drive permits full engine power to be delivered to the driving wheels at practically any locomotive speed. In spite of this advantage it was felt that the first locomotives had too little power for heavy switching operations; heavy cuts of cars could not be moved fast enough. Now 600-hp. oil-electric locomotives with two engines are in service, and are performing in a very satisfactory manner. Larger locomotives are now under construction.



A Four-Car, Two-Unit Train on the Electrified Suburban Section of the Illinois Central, Showing Catenary and Signal Installation

The recently built rail cars are heavy compared with the average of those built a few years ago and here again the electric drive has found favor in meeting the operating requirements. Eighty-five per cent of the cars ordered in 1926 have electric drive. The drive protects the engine from road shock and permits the use of more than one engine when desired. It is interesting to note also that more than 1,000 gasoline-electric buses have been placed in service during the past few years by street railway and bus transportation companies. The drive finds favor in this application because it provides desirable operating characteristics and because relatively high over-all fuel efficiency is obtained when stops are frequent. This high efficiency is due to the fact that although the electric transmission has greater losses than the gear drive, the engine is permitted at all times to operate at an efficient speed.

Santa Fe Buses Operating on the Indian Detour in New Mexico

Railways Adopting Motor Transport

Substantial increase in use of buses and trucks during past year

By John C. Emery
Motor Transport Editor, *Railway Age*

PROGRESS in the adoption of motor transport by the steam railways, while less in general than some had expected and predicted, was substantial in 1926. The expansion of the railways into the new field of highway transportation has been steady rather than spectacular. Their attitude has been one of willingness to be convinced of the benefits of bus operation and scarcely a month has passed during the last year in which some road did not announce its intention of establishing one or more bus lines. As a result, the number of railways operating buses at the present time is almost double that of a year ago, and the number of buses owned by the steam railways has more than doubled.

There has also been a greater use of motor trucks for the handling of l.c.l. freight in terminals and over short line hauls. The development in this respect has been less striking, however, largely for the reason that a greater proportion of the railways were operating trucks for freight haulage a year ago than were operating buses. The already large list of railroads using motor trucks has been increased during the year just closed, however.

New Users of Buses

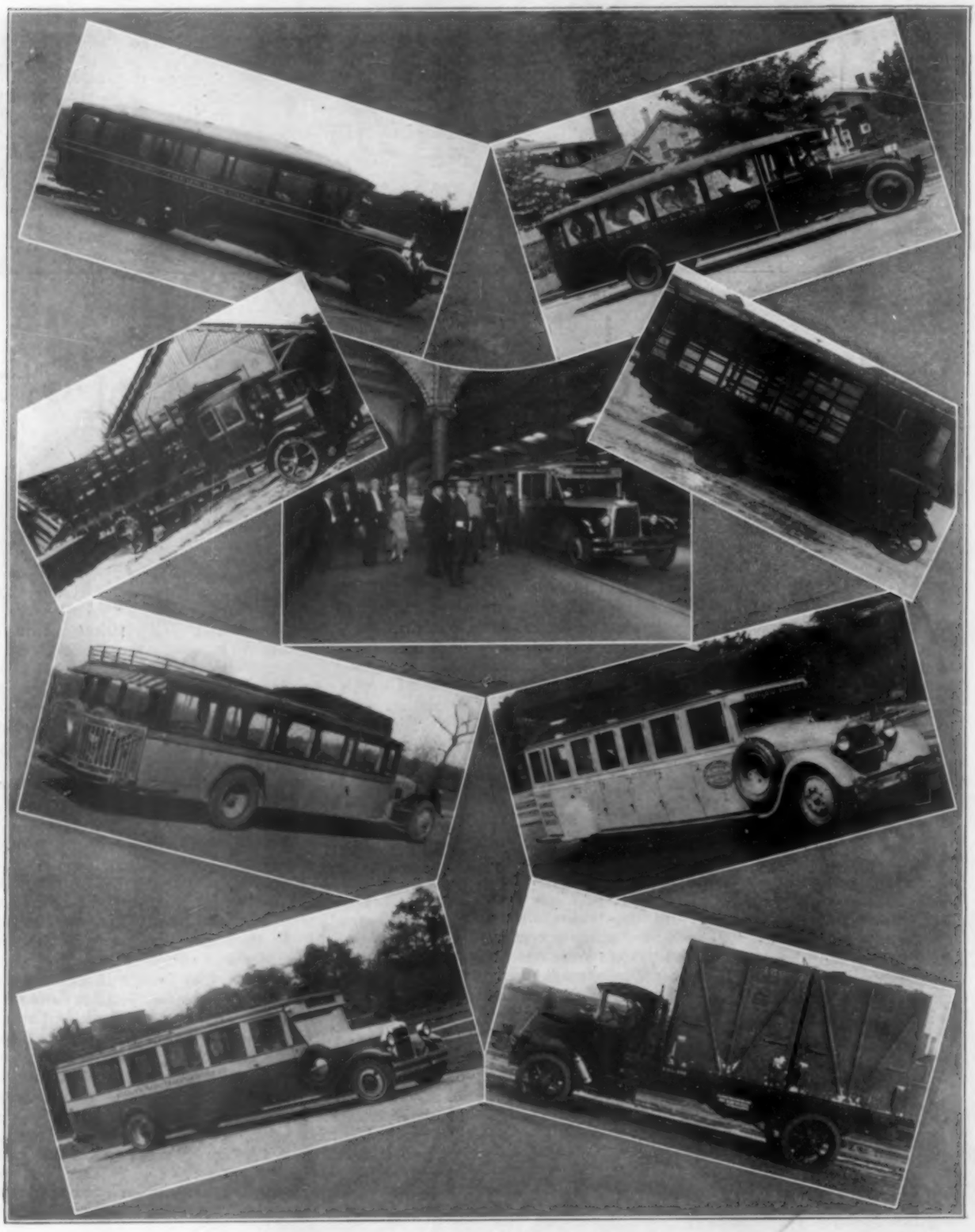
In 1926, a number of railways began their initial operation of motor buses in various kinds of service. Among these were the Baltimore & Ohio, the Pennsylvania, the Norfolk Southern, the Chicago & Alton, the Nashville, Chattanooga & St. Louis, the Atchison, Topeka & Santa Fe, the Denver & Rio Grande Western, the Minnesota Western, the Rutland, and the Chattahoochee Valley.

The bus operation of the Baltimore & Ohio has aroused wide interest on account of its novel nature. Withdrawing from the Pennsylvania station which it had used as a New York terminal, the B. & O. last August began the operation of its trains only as far as Jersey City, N. J., extending its service to Manhattan Island and Brooklyn by means of train connection motor buses. These buses have their principal terminal in New York at Pershing Square and run to Jersey City over two routes, stopping enroute at substations located in several of the principal hotels. The Baltimore & Ohio has just extended its bus service to Brooklyn, the busses running from the business district of Brooklyn via the Manhattan bridge and the Liberty street ferry to Jersey City.

The bus line of the Pennsylvania parallels one of its branch lines in Pennsylvania; that of the Norfolk Southern extends from Norfolk, Va., to Virginia Beach; that of the Chicago & Alton, from Jacksonville, Ill., to St. Louis, Mo.; that of the Nashville, Chattanooga & St. Louis parallels the Tracy City branch in Tennessee; those of the Denver & Rio Grande Western, between Denver, Colo., and Pueblo, and in the vicinity of Grand Junction, Colo.; that of the Minnesota Western parallels a portion of its line in northern Minnesota; and that of the Chattahoochee Valley parallels its line in Georgia. In addition, the Pennsylvania has just received authority to establish another bus route in Pennsylvania paralleling another branch.

The Atchison, Topeka & Santa Fe has engaged in bus operation by providing bus service over the "Indian Detour" in New Mexico. Its buses are operated by Fred Harvey for the Sante Fe.

In addition to these 10 roads the Reading and the Central of New Jersey have incorporated companies to operate as bus subsidiaries. The Reading has just received authority to establish one short bus line but as yet has been unable to secure from the Public Service Commission of Pennsylvania the necessary certificates for the greater part of its program. The granting of these, however, is expected in the near future, and when they are secured the Reading will have a comprehensive system of bus lines to supplement its passen-



Representative Railroad Buses and Trucks

ger train service on all parts of its system. The Central of New Jersey has not yet announced where it plans to operate its buses.

There has been a well-defined tendency to increase the scope of their bus operations on the part of railways providing such service prior to last year. The New York, New Haven & Hartford through the New England Transportation Company; the Boston & Maine through the B. & M. Transportation Company; and the Great Northern through the Northland Transportation Company, are outstanding among these roads. The New England Transportation Company is now the largest railway operator of buses, having some 190 buses in its fleet. The Northland Transportation Company is next in size, with 142 buses operating over more than 2,000 miles of highways.

Use of Trucks Spreads

There have been several notable additions to the list of railways using motor trucks for the haulage of l.c.l. freight. The Chicago, Rock Island & Pacific has been experimenting for the past six months with the use of tractors and trailers for the handling of l.c.l. freight between its Taylor street station in Chicago and suburban stations in the Chicago district. The New Haven has made a number of contracts with independent trucking concerns for the handling of its freight in several of its terminals. The Denver & Rio Grande Western, through the acquisition of a truck line competitor, is now providing motor truck service for l.c.l. freight over three lines in western Colorado.

A tendency to expand such operations is also to be noted in the case of railways which were operating trucks a year ago. The New York Central, the Pennsylvania, the Boston & Maine, the Lehigh Valley, and the Long Island, among others, have widened the scope of their truck operations considerably.

Railroad Motor Transport Conference

An event of outstanding importance in the motor transport field during the past year was the organization of the Railroad Motor Transport Conference. This conference, membership in which is limited to officially appointed representatives of steam railways, has as its purpose the study of the problems of bus and truck operation and the dissemination of the findings of the conference to the member roads.

The Railroad Motor Transport Conference had its inception at a meeting held at Atlantic City, N. J., last June. Subsequently a three-day meeting was held in the vicinity of Boston, Mass., where studies of the bus operations of the New Haven and the Boston & Maine, and the truck operations of the latter road were made. At this meeting the conference was formerly organized and arrangements were made for the holding of another meeting at Chicago on December 1 and 2.

The interest among the railways in the motor transport conference is evidenced by the large number of them which have consistently participated in the meetings.

Through negotiations which have been under way for several months, the Railroad Motor Transport Conference is expected soon to become definitely affiliated with the American Railway Association.

The Regulation Situation

The investigation into motor transport and its relation to the railways, which was instituted by the Interstate Commerce Commission last June, was the principal development of the year under the subject of bus and truck regulation. The commission instituted its investigation in order to secure information upon which to base its conclusions as to the desirability of federal legislation affecting the interstate highway carriers, such conclusions to be transmitted to Congress in the form or recommendations for appropriate legislation. Hearings were held at 12 cities throughout the United States, with a final hearing at Washington, D. C., on October 25, 1926.

The hearty interest in the hearings manifested by all the organizations and groups involved was great, and the commission was able to secure a mass of data on all sides of the question.

The railways themselves took little active part in the hearings, confining their participation in general to the filing with the commission of exhaustive answers to its questionnaire. The few roads that did make appearance at the hearings testified regarding the heavy losses in freight and passenger business that have followed the wide-spread use of motor vehicles in recent years.

Laws of Thirty-Eight States Provide for Some Form of Regulation

The year has seen little change with respect to legislation affecting motor vehicles in the individual states. The number of states having laws providing for some sort of regulation of the highway carriers is now 38. The various state public utility commissions are showing a keen interest in the subject of regulation of motor vehicle carriers and have united to propose the enactment of federal legislation providing for the regulation of the interstate carriers.

Certain of the railways proposing the operation of motor buses to supplement their rail service have met with considerable difficulty in securing the necessary certificates of permission to operate. This has been particularly true in Pennsylvania, where the Reading and the Pennsylvania are still marking time, unable to carry out their comprehensive plans for bus operation. In West Virginia, also, the Baltimore & Ohio is encountering some difficulty in securing permission to carry out its plan for the operation of several bus lines. In most other states, however, the attitude of the state commissions has been helpful to the railways. A notable decision affecting the railroad operation of motor vehicles was that of the Illinois Supreme Court, which held that the state regulatory commission must offer to existing carriers the right to provide any additional service required by the public convenience and necessity before authorizing any other concern to enter its field.

Developments Among Independents

The past year has seen a number of events of importance transpire among independent operators of buses and trucks. The trend is definitely toward consolidation. Plans have recently been announced for the consolidation into one system of bus lines in the middle west centering around Chicago, and another system covering virtually all parts of the state of Kentucky. While the number of companies operating buses and trucks as common carriers is somewhat less than a year ago, the number of vehicles operated has shown a decided increase. It is apparent that the field for the operation of motor vehicles has by no means been covered and that the competition which the railways must meet from the highway carriers is to grow more widespread and more severe as the increase in the numbers of such competitors continues and as smaller and weaker concerns are consolidated into larger and more stable organizations.

Members of the Interstate Commerce Commission — *Underwood & Underwood, Inc.*

Progress Toward Consolidation

Acquisition of control of 31,000 *miles of line authorized by I. C. C.*

By Harold F. Lane
Washington Editor, *Railway Age*

ALTHOUGH railroad consolidations, in the technical sense of combinations into single systems for ownership as well as operation, are still awaiting proposed amendments of the consolidation sections of the transportation act, the Interstate Commerce Commission shows in its recent annual report that since the effective date of paragraph 2 of section 5 of that act in 1920 it has authorized thereunder acquisition of control over approximately 31,000 miles of line. This includes 6,328 miles covered by 48 applications granted during the year ended October 31.

Pending Applications

The commission held that applications for such authority to be granted must be supported by a clear and strong showing of public gain and during the past year it has denied the application of the New York, Chicago & St. Louis for authority to acquire control of the Chesapeake & Ohio, Hocking Valley, Erie and Pere Marquette and that of the Norfolk & Western to acquire control of the Virginian. The Van Sweringen interests are supposed to be still negotiating for a basis on which to present a new plan to the commission and a case of outstanding importance is pending on the application of the Kansas City Southern to acquire control of the Missouri-Kansas-Texas and that of the latter in turn to acquire similar control of the St. Louis Southwestern, through acquisition of a majority of the stock. Other important pending applications are those of the New York Central to lease the Michigan Central, the Cleveland, Cincinnati, Chicago & St. Louis and the Chicago, Kalamazoo & Saginaw, which is being considered in connection with an application of the Big Four to lease the Cincinnati Northern and the Evansville, Indianapolis & Terre Haute; that of the Texas & New Orleans to lease for unified operation eleven of the Texas and Louisiana lines of the Southern Pacific having a total of some 4,000 miles; that of the Atlantic Coast Line to acquire control of the Atlanta, Birmingham & Atlantic, and that of the New York, New Haven & Hartford to lease the Central New England.

Interpretation of Present Law

Under paragraph 2 of section 5 the commission is authorized to approve the acquisition by one carrier of control of another carrier, whether by lease, purchase of stock, or "in any other manner not involving the consolidation of such carriers into a single system for ownership and operation." Chairman Eastman in many of the cases has filed dissenting opinions taking the position that the acquisition of control by a 999-year lease or by purchase of the entire capital stock amounts to a consolidation which the commission is without power to approve, and much confusion has been caused in the minds of laymen as to the difference between a "consolidation" and any other kind of a merger, but a majority of the commission has adopted the view that such acquisitions do not amount to "ownership," even if in some cases they have involved combination into a single system for operation.

Altogether since the act was passed the commission has issued such authorizations in about 150 cases, although the number of properties acquired is somewhat less than this, because there have been many instances in which a road has been acquired by one company as an intermediate step and the latter company has in turn been brought under the control of another.

It will be noted from the accompanying table that a good many short lines have been taken over by connecting trunk lines, which was one of the objects Congress

had in mind, and the same thing has been true in former years, but there are still several hundred short lines many of which would like to be taken over by some one, and the American Short Line Railroad Association is conducting a vigorous campaign in connection with the larger merger cases to have the commission attach to its orders conditions which will give the connecting short lines an opportunity to be included.

Several Class I carriers, notably the Missouri Pacific, the Southern Pacific and the Illinois Central, have extended and rounded out their systems through acquisitions of control under paragraph 2 and the Seaboard Air Line and the Atlantic Coast Line have recently been active in the same way. The New York Central, Pennsylvania, Santa Fe and others have utilized the controls effected to consolidate the operations of the lines of subsidiary companies with those of the parent companies and have indicated a desire to go much farther in the same direction.

AUTHORIZATIONS OF CONTROL OF ONE CARRIER BY ANOTHER CARRIER UNDER PARAGRAPH (2) OF SECTION 5 OF THE INTERSTATE COMMERCE ACT, CALENDAR YEAR 1926

Carrier acquiring control	Owning company	Control acquired Miles of road	How acquired
Atchison, Topeka & Santa Fe	Rocky Mountain & Santa Fe	100.580	Lease.
Do.	Fresno Interurban	17.500	Purchase of stock and lease.
Do.	Garden City, Gulf & Northern	38.000	Lease.
Do.	New Mexico Central	116.000	Purchase of stock and lease.
Do.	Corona & Santa Fe	15.000	Purchase of stock and lease.
Do.	Healdton & Santa Fe	36.000	Purchase of stock.
Atchison, Topeka & Santa Fe and Western Pacific	Alameda Belt Line	3.960	Purchase of stock.
Atlantic Coast Line	Columbia, Newberry & Laurens	75	Purchase of stock.
Baltimore & Ohio	Cincinnati, Indianapolis & Western	308.630	Purchase of stock.
Do.	Dayton & Union	31.940	Operating contract.
Do.	Hamilton Belt	2.940	Operating contract.
Canadian Pacific	Connecticut & Passumpsic Rivers	69.000	Lease.
Chesapeake & Ohio	Island Creek	5.430	Purchase of stock.
Do.	Pond Fork & Bald Knob	13.100	Purchase of stock and lease.
Do.	Chesapeake & Hocking	63	Purchase of stock.
Chicago & Illinois Midland	Springfield, Havana & Peoria	77,020	Purchase of stock and lease.
Chicago & North Western	Chicago, St. Paul, Minneapolis & Omaha	1,749.190	Purchase of stock.
Gulf, Colorada & Santa Fe	Oklahoma, New Mexico & Pacific Co. and Ringling & Oil Fields	36.000	Lease.
Gulf, Mobile & Northern	Jackson & Eastern	33.000	Purchase of stock.
Inland Waterways Corporation	Warrior River Terminal	18.000	Purchase of stock.
Kansas City Southern	Texarkana & Fort Smith	105.000	Lease.
Louisville & Nashville	Cumberland & Manchester	25.590	Purchase of stock and lease.
Missouri-Kansas-Texas, New Orleans, Texas & Mexico, and Atchison, Topeka & Santa Fe	Texas City Terminal	6.380	Purchase of stock.
Missouri Pacific	Marion & Eastern	10.000	Purchase of stock.
Do.	New Orleans & Lower Coast	59.7	Purchase of stock.
New Orleans, Texas & Mexico	San Antonio Southern	55	Purchase of stock.
New York Central	Hudson River Connecting	26.500	Lease.
Do.	Bailey Run, Sugar Creek & Athens	3.600	Purchase of stock.
Panhandle & Santa Fe	South Plains & Santa Fe	166.460	Lease.
Pennsylvania	Western Allegheny	47.890	Purchase of stock.
Do.	St. Louis Connecting	9.200	Purchase of stock.
Do.	Pennsylvania, Ohio & Detroit	793.000	Lease.
Pittsburgh & West Virginia	West Side Belt	22.630	Operating contract.
Seaboard Air Line	Tavares & Gulf	33.950	Purchase of stock.
Do.	Brooksville & Inverness	18.740	Purchase of stock and lease.
Do.	Tampa Northern	58.870	Lease.
Southern Pacific	Holton Inter-Urban	10.477	Purchase of stock.
Do.	Dayton-Goose Creek	25.140	Purchase of stock.
Do.	Nevada-California-Oregon	154.630	Purchase of stock.
Do.	Oregon, California & Eastern	40.000	Purchase of stock.
Texas & New Orleans	Dayton-Goose Creek	25.140	Lease.
Utah	National Coal	8.500	Purchase of stock and lease.
Yazoo & Mississippi Valley	Alabama & Vicksburg and Vicksburg, Shreveport & Pacific	329.000	Lease.

Proposed Amendatory Legislation

Amendatory legislation to make more effective the policy evidently intended in the consolidation provisions of the law of 1920 has been urged and considered now for several years, having been recommended by President Harding shortly before his death, by President Coolidge in his last three messages to Congress, and by the Interstate Commerce Commission in its last two annual reports as well as in testimony before congressional committees. It is not considered likely, however, that anything will have been strained through the fine meshes of the congressional filter before another session. The views of most interests that have shown an active concern in the matter seem to be fairly well represented in a general way in the Parker bill now pending in the House committee on interstate and foreign commerce, which has held hearings on the bill and may report it in time so that it may be considered by the House at the present session, but any further progress during the short session is doubtful. The Parker bill, in brief, omits the requirement of the existing law that the commission shall adopt a complete consolidation plan before approving actual consolidations in particular instances and would give the commission broad powers to approve or disapprove consolidations, acquisitions of control, mergers or unifications in any appropriate manner. This is what the commission recommends and meets the views expressed by the President, by the railroads in general, although they are proposing certain amendments, and by many organizations.

On the calendar of the Senate, which for a long time had delegated most of its interest in the subject of consolidation to the late Senator Cummins, is the bill which he had drafted and which the committee on interstate commerce had allowed him to revise and report, but it is based on the idea of exerting as much governmental pressure as possible to force the process of railway consolidation, besides including the idea of a commission-made general plan. For these as well as some other reasons those most interested in promoting some consolidation legislation found it advisable to get a new start in the House committee. The authorship of the Parker bill has never been publicly announced but it is understood to have been a composite of the work of many minds.

Views of the I. C. C.

On December 17 Senator Fess, of Ohio, introduced in the Senate a bill, S. 4892, which includes some slight modifications of the Parker bill as the result of views expressed at the hearings.

The Interstate Commerce Commission is not quite so enthusiastic as some other people as to the advantages to be derived from railway consolidation. A statement

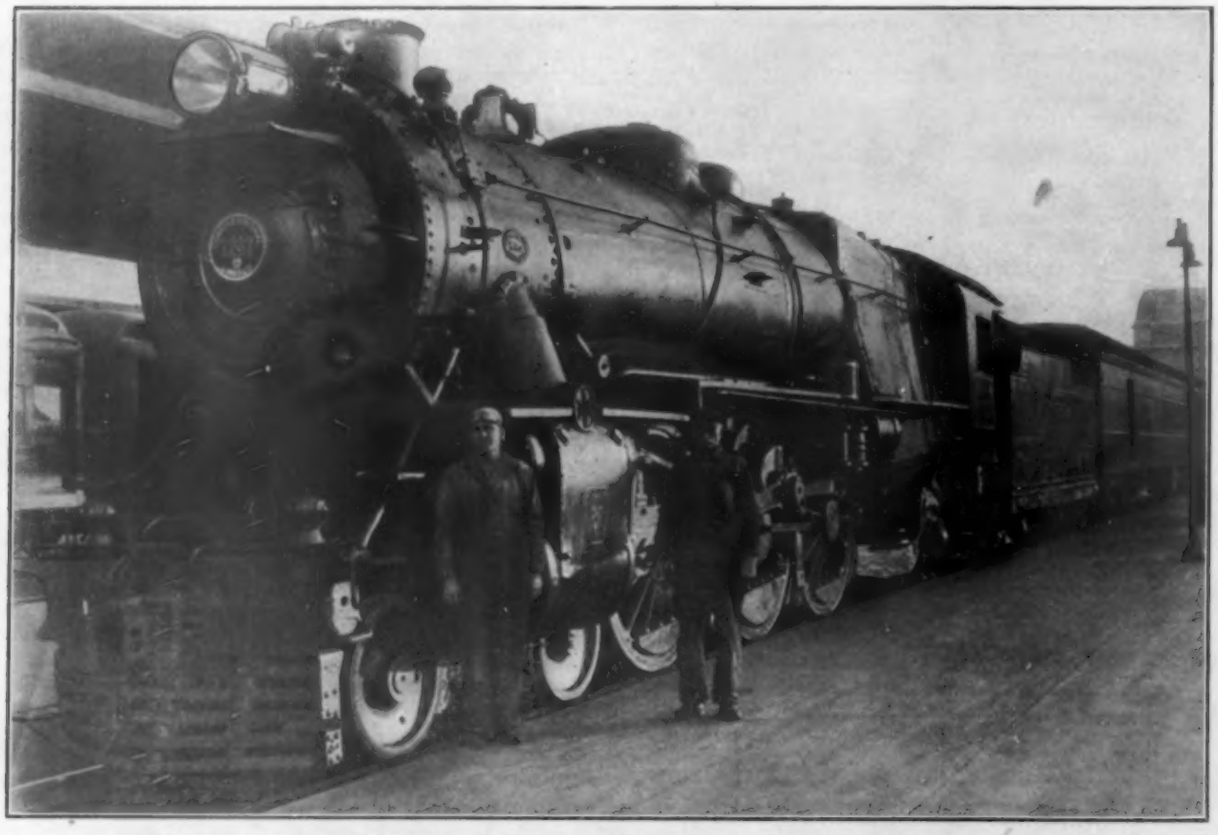
of the views of a majority of the commissioners, as given last January before the Senate committee by Chairman Eastman, indicated that while they believe consolidations or unifications may often be most desirable, they also believe that the desirability of consolidation in a short time into a few great systems cannot be demonstrated except by actual experience. In their judgment, Chairman Eastman said, "the country ought not to be rushed headlong into any gigantic plan of consolidation which may later prove to be misconceived and based upon mistaken premises," but it ought instead to "proceed cautiously without any undue anticipation of possible beneficial results, feeling its way along step by step, watching and analyzing results, and allowing experience to guide." In its recent annual report the commission repeated its previous recommendations as to changes in the law and said that in view of the probability of legislation it has deferred the adoption and publication of a complete plan.

While the Association of Railway Executives has not appeared as urging consolidation legislation, because of some differences of opinion among the executives as to the desirability of a consolidation policy, it has taken the position that if there is to be legislation it should be permissive as distinguished from compulsory, and Alfred P. Thom, its general counsel, has made a comprehensive presentation before both Senate and House committees as to the conditions which should be taken into consideration in the framing of a bill.

As the law now stands actual consolidations in the technical sense are prohibited, except in the comparatively few instances where they are possible under state laws, by the terms of the law which was intended to make provision for the grouping of the railways into a limited number of systems. This is because of its requirement that such consolidations shall not take place until the commission has promulgated its complete plan and is able to find that a proposed consolidation is in harmony with that plan. This situation operates to prevent many consolidations of considerable importance, not only in the direction of bringing under a single control companies that are not now identified, but also in the direction of solidifying the structures of many systems that now are under a common control but are not allowed to effect complete consolidation.

The provisions for acquisition of control afforded by paragraph 2 of section 5, however, have permitted considerable progress in the direction of bringing subsidiaries into more direct relation with the parent companies and the list of Class I railroads that file separate reports with the Interstate Commerce Commission has since 1920 been reduced from over 200 to 185, chiefly as the result of absorptions into the larger systems under long-term leases. The names of many well-known companies have thus disappeared, at least from public view, and ten more or so will go the same way in the near future if the commission acts favorably on pending applications. For example the Pennsylvania Railroad, whose reports to the commission in 1920 covered about 7,000 miles, is now reporting directly for over 10,000 miles of its system.

The authorizations granted during the past year by the Interstate Commerce Commission are shown in the accompanying table.



Locomotives Which Handle the P. R. R.'s Congressional Limited Have a Special Emblem on the Front End and the Road's Monogram on the Cylinder Jackets

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On the Black Butte Cut-off of the Southern Pacific in California, near Mt. Shasta

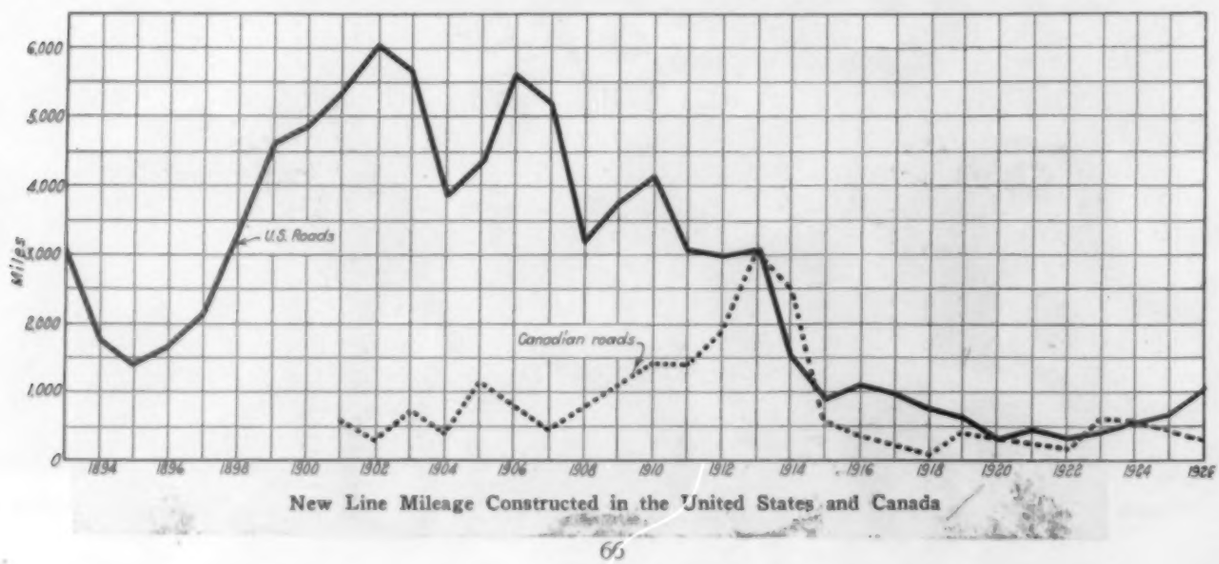
Roadway Construction Active in 1926

Mileage of new lines completed larger than for any year since 1916—Heavy expenditures also made for other work

By F. M. Patterson
Associate Editor, *Railway Age*

RAILROAD construction was at a higher level during 1926 than in any recent year and the aggregate length of new lines built, 1,005 miles, was greater than for any years since 1916 when the total was 1,098 miles, exceeding by 361 miles the amount built in 1925. On the other hand the total length of second track built during the year was only 473 miles, a reduction of 209 miles from the figure for 1925, indicating that the second track built in the years immediately preceding had supplied the more imperative needs and also that the more intensive use of facilities had obviated the immediate necessity for additional trackage in many cases. Including first and multiple main tracks the total for 1926 was 1,527 miles, compared with 1,354 miles in 1925.

It is significant that much of the new line mileage con-



New Line Mileage Constructed in the United States and Canada

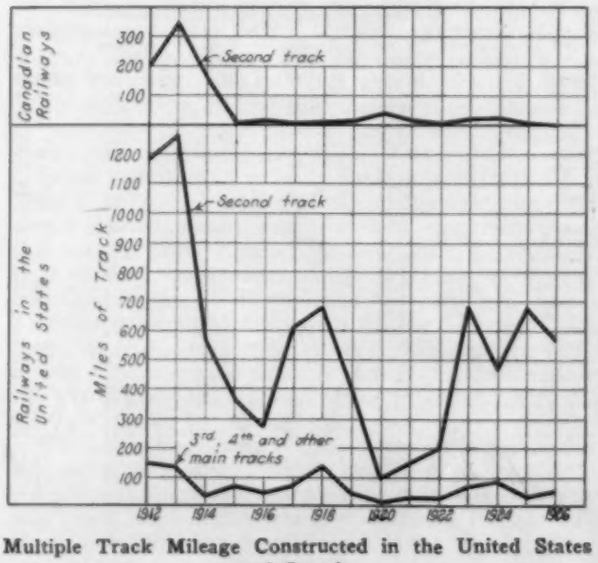
sisted of relatively long lines instead of short extensions as has been the case for a number of years past. Some of these, such as the 145 miles built by the Southern Pacific in Arizona, and the 93-mile Rogerson-Wells line of the Oregon Short Line in Idaho and Nevada were constructed primarily to provide new routes for the economical handling of traffic, while others, including the 242 miles built by five different railroads in Texas were planned principally for the purpose of opening up undeveloped territory. That the railroads have faith in the future is evidenced not alone by the increase in new

Miles of New Line Completed in the United States Since 1893

1893	3,024	1910	4,122
1894	1,760	1911	3,066
1895	1,420	1912	2,997
1896	1,692	1913	3,071
1897	2,109	1914	1,532
1898	3,265	1915	933
1899	4,569	1916	1,098
1900	4,894	1917	979
1901	5,368	1918	721
1902	6,026	1919	686
1903	5,652	1920	314
1904	3,832	1921	475
1905	4,388	1922	324
1906	5,623	1923	427
1907	5,212	1924	579
1908	3,214	1925	644
1909	3,748	1926	1,005

lines, but also by their heavy expenditures for other additions to their property. The capital expenditures for improvements for the first nine months of 1926 amounted to $629,000,000, according to figures compiled by the Bureau of Railway Economics, an increase of approximately $100,000,000 over similar capital expenditures for the corresponding period of 1925, while the total for the entire year of 1926 was estimated at $875,000,000.

In Canada the construction of new lines showed a marked decrease as compared with 1925, amounting to



Multiple Track Mileage Constructed in the United States and Canada

335 miles, as compared to 414 miles in the previous year. Of this total 196 miles were built by the Canadian Pacific and 116 miles by the Canadian National. This mileage consisted of the extensions of branch lines, principally in the western provinces. No new second track was reported in Canada for the year.

Mexico also shows a decided decrease in mileage of

Lines Abandoned in the United States and Canada

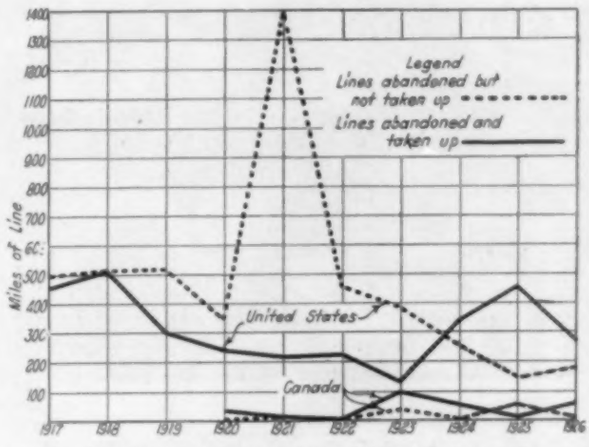
	Lines Abandoned and Taken Up Miles	Lines Abandoned but Not Taken Up Miles
United States		
Atchison, Topeka & Santa Fe—		
Middletown, Ariz., to Crown King	12.89	....
Boston & Maine—		
Wakefield Jct., Mass., to Peabody	....	8.13
Danvers Jct., Mass., to Andover	....	14.85
Wilmington Jct., Mass., to Tewksbury Jct.	....	3.20
Tewksbury Jct., Mass., to Pikes Siding	....	5.20
At Lawrence Junction, Mass.	....	0.42
East Milford, N. H., to Grasmere Jct.	....	18.54
Bethlehem Jct., N. H., to Bethlehem	....	3.42
Kennebunk, Me., to Kennebunkport	....	4.63
Bloomsburg & Sullivan—		
Benton, Pa., to Jamison City	9.00	....
Cache Valley—		
Sedgwick, Ark., to Light	10.30	....
Central New England—		
Shekomeko, N. Y., to Millerton	7.73	....
Tanners, N. Y., to Boston Corners	2.60	....
Chesapeake & Ohio—		
Mineral, Va., to Sulphur Mines, Va.	....	4.00
Chicago, Milwaukee & St. Paul—		
Tomah, Wis., to Norway	12.71	....
Wausaukee, Wis., to Girard Jct.	17.70	....
Chicago, Rock Island & Pacific—		
Preemption, Ill., to Cable	5.78	....
Homestead, Okla., to Watonga	23.41	....
Colfax & Northern—		
Colfax, Iowa, to Shaft No. 9	5.50	....
Colorado & Southern—		
Buena Vista, Colo., to Hancock	29.61	....
Denver & Rio Grande Western—		
Moffatt, Colo., to Cottonwood	....	16.96
Donora Southern—		
At Baird, Pa.	0.12	....
Eagles Mere—		
Sonestown, Pa., to Eagles Mere Park	....	9.50
Erie—		
Macopin Lake, N. J., to Echo Lake	1.54	....
Keylers Corners, Pa., to Toby Mines	2.30	....
Brockway, Pa., to West Clarion Mines	1.80	....
Crawford Jct., Pa., to Alton	....	1.95
Bradford, Pa., to Nusbaum	....	3.68
Fairchild & North-Eastern—		
Fairchild, Wis., to Cleghorn	27.00	....
Greenwood, Wis., to Owen	15.00	....
Great Northern—		
Holman, Minn., to Coleraine	4.21	....
Windham, Mont., to Lehigh	4.72	....
Lead Belt—		
Flat River, Mo.	7.86	....
Lehigh & New England—		
Glenwood Branch	....	2.38
Louisiana & Pacific—		
Various short connections	1.10	....
Mojave Northern—		
Leon, Cal., to Powell	....	7.00
Nacogdoches & Northeastern—		
La Cerda, Tex., to Pershing	14.00	....
Neame, Carson & Southern—		
Neame, La., to Camp Baker	25.32	....
New York, New Haven & Hartford—		
At Dedham, Mass.	0.38	....
Harrison Square, Mass., to Mattapan	....	4.24
At River Point, R. I.	....	0.49
Oklahoma & Arkansas—		
Kenwood Jct., Okla., to Day	....	20.00
Pere Marquette—		
White Cloud, Mich., to Big Rapids	18.97	....
St. Louis-San Francisco—		
Lowry Jct., to Harlan Jct.	....	12.90
Harlan Jct., Mo., to Vista Jct.	3.40	....
Sandy River & Rangeley Lakes—		
North of Caribassett, Me., to Bigelow	4.00	....
Sheffield & Tionesta—		
Tionesta, Pa., to Nebraska	....	7.00
Southern Pacific—		
Black Butte, Cal., to near Igerna	1.61	....
Waco, Tex., to Ross	....	11.00
Texas Pacific—Missouri Pacific Terminal—		
At New Orleans, La.	0.45	....
Waycross & Western—		
Waycross, Ga., to Cogdell	....	20.50
Woodworth & Louisiana Central—		
Woodworth, La., to Lamorie	6.00	....
Total	277.01	179.99
Canada		
Great Northern—		
Carman, Man., to Portage La Prairie	34.47	....
Fernie, B. C., to Michel	20.96	....
West Gretna, Man., to Plum Coulie	....	14.97
Sydney & Louisburg—		
No. 17 Colliery to Waterford Lake Power Plant	1.10	....
Total	56.53	14.97

new lines constructed, due largely to the smaller amount built by the Southern Pacific of Mexico, as a result of the practical completion of its west coast extension, only 20 miles being completed in 1926, as compared with 69 miles in the previous year. Aside from this extension the activities of this road were largely given over to the rehabilitation of its lines which were damaged during the revolution and which also suffered from washouts due to torrential rains in 1925 and 1926. The construction of 7.5 miles of new line by the El Oro Mining & Railway Company was the only other addition to mileage reported by Mexican roads.

In the United States, Texas leads in the construction of new lines with 242 miles, of which Southern Pacific built 96.5 miles near the Mexican border, south of San Antonio, and the Missouri Pacific System built 50 miles in the same territory, these lines providing rail facilities for portions of the country which previously had been without service. In the Panhandle region the Atchison, Topeka & Santa Fe built 31 miles to develop new territory, while the Chicago, Rock Island & Pacific built 36.7 miles northerly from Amarillo which will serve territory previously without railroad facilities and also form a portion of a new main line from Amarillo to Liberal, Kan. Projected work indicates that Texas will remain well in the lead in railroad construction in 1927, a total of more than 200 miles of new lines having been authorized in the Panhandle by the Interstate Commerce Commission, while construction will continue in the region near the Rio Grande.

Florida was second in new lines with 233 miles. The Seaboard Air Line, through its subsidiary, the Seaboard All-Florida, completed its line from West Palm Beach to Miami, 70.5 miles, and also built a line from Ft. Ogden to Naples, 68 miles. Lines aggregating 94 miles were built in the western part of the state by the Atlantic Coast Line, one of which, between Monticello and Perry, will provide a new short route between the central states and the west coast.

Arizona is third in point of new lines constructed, with 145 miles built by the Southern Pacific between Picacho and Pozo Junction and between Hassayampa and Wellton, which with existing lines, form an alternate route between Picacho and Wellton. Besides affording a short route for traffic from the mines near Magma the new line serves in effect as a double track for the old main line by relieving it of much of the former traffic.



Miles of Line Abandoned in the United States and Canada

Nevada with 72 miles of new line, holds fourth place, due to the completion of the Rogerson-Wells line of the Oregon Short Line. In Oregon the Southern Pacific finished 36 miles on the Natron cut-off and completed the line from Black Butte, Cal., to Grass Lake, 24 miles. A short extension of considerable importance was that of the Chicago and North Western from Benld, Ill., to Staunton, 2.5 miles, to afford connection with the Litchfield & Madison, providing the North Western with an entrance to the St. Louis-East St. Louis district.

New Track Built in 1925

United States	Number companies building	Miles: First track	Second track	Third track	Fourth or more track	Total
Alabama	3	3.25	....	....	....	3.25
Alaska	1	....	2.79	....	....	2.79
Arizona	2	16.24	....	....	....	16.24
Arkansas	2	23.50	11.23	....	....	34.73
California	7	29.92	23.27	.90	....	54.09
Connecticut	1	.23	....	....	....	.23
Florida	4	99.03	236.50	....	....	335.53
Georgia	2	1.68	39.80	....	....	41.48
Idaho	1	30.40	....	....	....	30.40
Illinois	5	23.54	1.20	1.27	1.08	27.09
Indiana	1	2.30	....	....	....	2.30
Kansas	4	12.70	19.01	....	....	31.71
Kentucky	4	....	45.25	7.56	3.66	56.47
Louisiana	4	12.52	4.43	....	....	16.95
Michigan	6	48.54	38.58	0.80	....	87.92
Minnesota	3	1.19	8.69	3.50	....	13.38
Mississippi	2	16.50	....	....	....	16.50
Missouri	2	.63	30.36	....	....	30.99
Montana	1	19.92	0.75	....	....	20.67
New Jersey	2	6.22	....	4.80	4.80	15.82
New York	2	10.94	2.62	....	....	13.56
Ohio	8	29.00	75.33	.03	.01	104.37
Oklahoma	3	58.80	....	....	....	58.80
Oregon	2	30.05	....	....	....	30.05
Pennsylvania	2	.24	.90	....	....	1.14
S. Carolina	3	17.06	90.27	....	....	107.33
Tennessee	2	21.14	3.98	....	....	25.12
Texas	5	96.72	1.47	....	....	98.19
Utah	1	8.90	....	....	....	8.90
Vermont	1	.47	....	....	....	.47
W. Virginia	3	....	46.03	....	....	46.03
Washington	3	21.90	....	....	....	21.90
Total	..	643.53	682.46	18.86	9.55	1,354.40
Canada	7	414.29	3.67	....	....	417.96
Mexico	4	132.38	....	....	....	132.38

New Track Built in 1926

United States	Number companies building	Miles: First track	Second track	Third track	Fourth or more track	Total
Arizona	1	145.69	24.44	....	....	170.13
Arkansas	1	.06	5.00	....	....	5.06
California	1	25.29	5.72	....	....	31.01
Colorado	2	16.35	....	....	....	16.35
Connecticut	1	0.38	....	....	....	.38
Florida	3	232.77	222.40	.91	....	456.08
Georgia	1	....	1.75	....	....	1.75
Idaho	1	21.08	....	....	....	21.08
Illinois	4	6.51	6.06	....	....	12.57
Indiana	1	0.27	.80	....	....	1.07
Kansas	1	0.18	5.38	1.68	3.40	10.64
Kentucky	3	20.75	25.96	....	....	46.71
Louisiana	3	16.66	....	....	....	16.66
Massachusetts	1	0.11	....	.20	.22	.53
Michigan	2	9.87	.74	....	....	10.61
Minnesota	2	15.67	....	....	....	15.67
Mississippi	1	14.70	....	....	....	14.70
Missouri	2	2.90	21.28	....	....	24.18
Montana	1	28.85	....	....	....	28.85
Nebraska	1	11.85	....	....	....	11.85
Nevada	1	72.10	....	....	....	72.10
New Jersey	1	....	....	.29	1.38	1.67
New York	3	....	3.95	12.42	3.92	20.29
N. Carolina	1	....	4.50	....	....	4.50
Ohio	6	....	101.18	8.27	8.31	117.76
Oklahoma	3	55.46	....	....	....	55.46
Oregon	1	35.92	....	....	....	35.92
Pennsylvania	4	.27	6.12	5.35	3.03	14.77
S. Carolina	1	....	2.50	....	....	2.50
Texas	5	242.23	....	....	....	242.23
Utah	1	6.28	25.80	....	....	32.08
Virginia	2	0.83	0.01	....	....	.84
Washington	1	7.50	....	....	....	7.50
W. Virginia	3	1.60	8.94	....	....	10.54
Wyoming	1	12.59	....	....	....	12.59
Total	67	1,004.72	472.53	29.12	20.26	1,526.63
Canada	..	334.90	....	....	....	344.90
Mexico	..	27.50	....	....	....	27.50

New lines projected for 1927 include the construction of 152 miles from Aberdeen, Miss., to Kimbrough, Ala., by the St. Louis-San Francisco to provide connection with the Muscle Shoals, Birmingham & Pensacola, which was recently acquired by the Frisco and which will enable it to reach the port of Pensacola over its own rails. Work is progressing on a 40-mile extension of the Jackson & Eastern, a subsidiary of the Gulf, Mobile & Northern, to Jackson, Miss., which with a 6-mile extension of the New Orleans Great Northern from Nogan, Miss., to Jackson, to be built in 1927, will provide a new route from the northern states to New Orleans through the Metropolis, Ill., gateway.

Construction of Second Track

As has been said, the mileage of second track constructed in 1926 was considerably smaller than in 1925, due to the completion of several major projects during the latter year. Florida again led in the construction of second track with 222.4 miles, as compared with 236.5 miles in 1925. Of this the Florida East Coast built 113 miles, virtually completing the double-tracking of its line from Jacksonville to Miami and the Atlantic Coast Line built 75.4 miles in congested territories, the longest stretch being 55.7 miles between Chatmar and Dade City. The Seaboard Air Line also built several stretches of second track in Florida, aggregating 34 miles. The Union Pacific, by building 25.8 miles of second track between Glen Echo, Utah, and Gateway, completed the double-tracking of its main line between Council Bluffs, Iowa and Ogden, Utah, a distance of almost 1,000 miles.

Aside from these projects, the mileage of second track constructed was made up of comparatively short stretches, as in Ohio, which takes second place, where 101.2 miles were built by six different roads. The use of heavier and faster power, the increasing use of locomotive boosters, and the installation of signals, interlocking and distant control of outlying passing track switches are factors that undoubtedly have been of great value in the expeditious handling of the vast volume of traffic with which the railroads were confronted during the year, thereby making unnecessary or postponing the construction of some second track which otherwise would have been necessary.

Grade reduction on existing lines, as in 1925, was confined to individual projects, local in character, but much new construction was inaugurated or continued during the year to provide easier gradients. Aside from the lines built by the Southern Pacific in Arizona, California and Oregon, to which reference has been made, work progressed throughout the year on the Edgewood, Ill., to Fulton, Ky., line of the Illinois Central, and the Chesapeake & Ohio started the construction of a double-track, low-grade line 63 miles long between Gregg, Ohio, and Valley Crossing late in the year.

An outstanding grade reduction project begun during the year is the tunnel 7.75 miles long on the Great Northern's line through the Cascade mountains between Scenic, Wash., and Berne, which will shorten the line 7.67 miles, and eliminate a large amount of 2.2 per cent grade against eastbound traffic, substituting therefor the tunnel grade of 1.53 per cent. Work also progressed satisfactorily during the year on the Moffatt tunnel in Colorado, which will afford the Denver & Salt Lake an easier crossing of the Continental divide, and it is expected that the tunnel will be completed in 1927.

Miscellaneous construction, including new yards and engine terminals, and the extension of such facilities, account for large sums expended in 1926. The Markham yard of the Illinois Central near Chicago, involving an outlay of $12,000,000, was completed and placed in service early in the year. The Florida East Coast made extensive additions to its freight terminal facilities at Jacksonville and Miami, as well as at intermediate points, to care for the heavy traffic in Florida. The Norfolk & Western undertook extensive yard work at Williamson, W. Va., and Portsmouth, Ohio, and the Chesapeake & Ohio completed freight terminal facilities at Clifton Forge, Va., at a cost of $3,630,000. The Pennsylvania, the New York Central, the Baltimore & Ohio, the Reading and the New York, New Haven & Hartford are among other roads which carried on extensive work of this character.

Considerable bridge work was done during the year, the outstanding project being the Newark Bay bridge of the Central of New Jersey, which was completed at a total cost of $13,500,000 and placed in service late in 1926. For the most part bridge work comprised the strengthening or replacing of old structures to provide for heavier loadings. The more important of these projects include the building of a new bridge across the Mississippi river at Ft. Madison, Iowa, by the Atchison, Topeka & Santa Fe, and the strengthening of the bridge across the Mississippi river at Memphis, Tenn., by the St. Louis-San Francisco.

Track elevation and grade separation continue to require large expenditures. Work was begun during the year by the Indianapolis Union in Indianapolis, Ind., which will require an ultimate outlay of $13,000,000, while the program of the Pennsylvania and the Baltimore & Ohio in South Philadelphia, which has been in progress for several years, will cost $25,000,000 on completion. Although the larger projects of this character are in the large cities, as they have been in the past, grade separation in the smaller towns and cities and in the country is calling for larger expenditures from year to year.

While large amounts were spent on station buildings in the aggregate, no large terminal stations were completed during the year. The station of the Boston & Albany at Springfield, Mass., was the largest project of this nature, costing $4,000,000. Terminal improvements at Buffalo, N. Y., to cost $14,000,000 were begun by the New York Central, which include the erection of a new passenger station.

Abandoned Lines

Lines abandoned in the United States in 1926 aggregated 457 miles, as compared with 606 miles in 1925, while in Canada the total for 1926 was slightly higher than for the previous year, amounting to 72 miles, as against 63 miles in 1925. As in the past, the lines abandoned consisted of short branches, and, aside from the mileage abandoned in New England because of motor bus and motor truck competition, most of the abandonments have been due to the exhaustion of the timber or mineral resources which the lines were originally built to serve.

It is interesting to note that, for the first time in 10 years, the mileage of new lines built exceeded the mileage abandoned by a comfortable margin. In 1916 the mileage constructed exceeded the mileage abandoned by a small amount, but in every year thereafter until 1925 the mileage abandoned exceeded the mileage built, the difference mounting to a peak of over 1,000 miles in 1921. In 1925 there was a slight excess of construction over abandonments, while in 1926 the length of new lines constructed exceeded the length of lines abandoned by 548 miles.

Railway Construction in the United States in 1926

Akron, Canton & Youngstown

Important Work Undertaken: Track for industrial development at Hazel street, Akron, Ohio, $260,000 (completed). Rebuilding viaduct at Akron, Ohio, $170.000 (completed). Rebuilding viaduct at Medina, Ohio, $160,000 (completed).

Ann Arbor

Important Work Undertaken: New car ferry slip and rearrangement of yard tracks, Frankfort, Mich., $194,655 (completed).

Ardmore, Vernon & Lubbock

Important Work Undertaken: Line projected, Ardmore, Okla., to Lubbock, Tex., 315 miles.

Atchison, Topeka & Santa Fe

First Track: (Panhandle & Santa Fe) Panhandle, Tex., to Isom, 31 miles.

Second Track: Mission Tower, Cal., to Hobart, 5.65 miles. East of Wellington, Kan., 5.38 miles.

Third Track: At Hutchinson, Kan., 1.68 miles.

Fourth Track: Turner, Kan., to Morris, 3.40 miles.

Important Work Undertaken: New double track bridge over the Mississippi river near Ft. Madison, Iowa (60 per cent completed). New double track bridge over the Des Moines river near Dumas, Mo. (30 per cent completed). New bridge over the Arkansas river near Mulvane, Kan. (projected). Raise of grade in connection with Cicero avenue subway, Chicago (10 per cent completed). Branner street viaduct, Topeka, Kan. (projected). Subway at Madison avenue, Arkansas City, Kan. (completed). Enlarge yard facilities, Chillicothe, Ill. (62 per cent completed). Auction house and receiving yards, Chicago (50 per cent completed). Team yard facilities, Chicago (completed). Yard changes, Marceline, Mo. (completed). Yard changes and subway, Chanute, Kan. (projected). Extend terminal yards, Arkansas City, Kan. (completed). New frog and switch shop, Newton, Kan. (21 per cent completed). New coaling station, Galesburg, Ill. (projected). New coaling station, Marceline, Mo. (45 per cent completed). Fire department and apprentice school building, Topeka, Kan. (projected). Mechanical facilities, Oklahoma City, Okla. (completed). Enlarge and remodel elevator facilities, Argentine, Kan. (completed). Yard changes, Clovis, N. M. (completed). Extend Harvey House, Clovis, N. M. (completed). Extend engine house, Clovis, N. M. (20 per cent completed). Yard changes, Glendale, Kan. (completed). Yard changes, Alhambra, Ariz. (completed). Yard changes, Phoenix, Ariz. (completed).

(Gulf, Colorado & Santa Fe.) Boiler and blacksmith shops, Cleburne, Tex. (completed).

(Panhandle & Santa Fe.) Yard extension, Amarillo, Tex. (completed). Grade reduction, Slaton division (completed).

(Osage County & Santa Fe.) Line under construction, Pawhuska, Okla., to Fairfax, 27.2 miles.

(Dodge City & Cimmaron Valley.) Manter, Kan., to Pritchett, Colo., 55.8 miles.

(Corona & Santa Fe.) Corona, Cal., to Alberhill, 14.6 miles.

Atlanta & St. Andrews Bay

Important Work Undertaken: Line under survey, Dothan, Ga., to Columbus, 100 miles.

Atlanta & West Point and Western Railway of Alabama

Important Work Undertaken: (Western Railway of Alabama.) New yard, Montgomery, Ala., $277,000 (completed).

Atlanta, Birmingham & Atlantic

Important Work Undertaken: Improvements at Brunswick docks, Brunswick, Ga., including dredging, trestle and platform, and storage tracks (completed).

Atlantic Coast Line

First Track: Perry, Fla., to Monticello, 40.17 miles.

(Tampa Southern) Sarasota, Fla., to Southfort, 40.8 miles.

(Ft. Myers Southern) Bonita Springs, Fla., to Naples, 13 miles.

Second Track: Moncrief, Fla., to Yukon, 9.09 miles. Orange City Jct., Fla., to Randa, 10.64 miles. Chatmar, Fla., to Dade City, 55.70 miles.

Important Work Undertaken: Lines under construction, Thonotosassa, Fla., to Dade City, 22.8 miles, and Immokalee, Fla., to Deep Lake, 28 miles. Yard and mechanical facilities, Thomasville, Ga. Yard and mechanical facilities, Dunnellon, Fla. Yard, Uceta, Fla. (completed). Shop facilities, Uceta, Fla. Shop facilities, Ocala, Fla. (completed). Shop facilities, St. Petersburg, Fla. (completed).

(Ft. Myers Southern.) Line under construction, Naples, Fla., to Marco, 16 miles.

Baltimore & Ohio

First Track: At South Parkersburg, W. Va., 1.6 miles.

Important Work Undertaken: Additional tracks in terminal yard, Rossford, Ohio, $1,120,000 (20 per cent completed). New freight yard and engine terminal, initial appropriation, Cincinnati, Ohio, $1,390,000 (10 per cent completed). New terminal yard and engine facilities, Ohio Junction, Ohio, $1,650,000 (10 per cent completed). Relocation of 7 miles of single track to serve as double track between Warwick, Ohio, and Sterling, $700,000 (completed). Perishable products terminal, joint with Reading, Philadelphia, Pa., $3,500,000 (85 per cent completed). Reconstruction of bridges, St. Marys, W. Va., to Parkersburg, $152,000 (70 per cent completed). Reconstruction of bridges, Belleville, W. Va., to Guyandotte, $285,000 (70 per cent completed). Reconstruction of bridges, Lincoln Hill, Pa., to Valley Grove, $197,000 (completed). Reconstruction of bridges, Warren, Ohio, to Fairport, $200,000 (completed). Reconstruction of bridges, North Baltimore, Ohio, to Tontogany, $115,000 (completed). Strengthening and extending bridge, Big Walnut, Ohio, $300,000 (completed). Reconstruction of bridge, Musselman, Ohio, $150,000 (completed. Reconstruction of bridges, Noble, Ill., to Salem, $170,000 (completed). Reconstruction of bridges, Aviston, Ill., $122,000 (completed). Track elevation and relocation, South Philadelphia, Pa., B. & O. proportion, $4,400,000 (43 per cent completed). Track elevation and rearrangement, Millvale, Pa., to Etna, $2,835,000 (completed).

(Staten Island Rapid Transit.) Track elevation, Princess Bay, N. Y., to Pleasant Plains, $1,050,000 (completed).

(Baltimore & Ohio Chicago Terminal.) Track elevation, Chicago, $100,000 (75 per cent completed).

Beaver, Meade & Englewood

First Track: Turpin, Okla., to Baker, 8 miles.

Important Work Undertaken: New line from Baker, Okla., to Hooker, 12 miles.

Belt Railway of Chicago

Important Work Undertaken: Track elevation between 93d and 95th streets, Chicago, from Indiana avenue easterly to Colfax avenue and southeasterly from 95th street to 112th street and Torrence avenue, including grade separation with Illinois Central at Burnside (joint with Chicago & Western Indiana) $4,675,000 (70 per cent completed).

Bessemer & Lake Erie

Important Work Undertaken: Building anchorage for dock front and rear runways on dock No. 1, Conneaut Harbor, Ohio, $205,000 (completed). Widening channel between docks No. 1 and No. 4 and construction of new front on dock No. 1, Conneaut Harbor, Ohio, $916,600 (90 per cent completed). Completion of fill for change of line, Pardoe, Pa., to Coolspring, $360,000 (completed). Grading, masonry and structures for change of line, Pardoe, Pa., to Coolspring, $694,936 (50 per cent completed). New double track line, Carter, Pa., to Enterprise, $397,450 (30 per cent completed). Enlarging yard and installing electro-mechanical interlocking plant, Branchton, Pa., $122,500 (completed).

Bingham & Garfield

Important Work Undertaken: New tracks, leased to Utah Copper Company, Bingham, Utah, $420,000 (completed).

Boston & Maine

Important Work Undertaken: General re-arrangement of freight terminal and consolidation of freighthouse facilities, Boston, Mass., $1,700,000 (95 per cent completed). New classification yard, White River Jct., Vt., $583,000 (50 per cent completed). Coal handling plant, Mystic Wharf, Boston, Mass., $461,000 (completed). Boiler shop extension to locomotive erecting shop, Billerica, Mass., $461,000 (completed). Increasing clearances of Hoosac tunnel to permit operation of maximum equipment, $190,000 (completed). Completion of office building, East Cambridge, Mass., $443,000 (completed).

Canadian National (U. S. A.)

Important Work Undertaken: Grade separation on West Detroit line between Vinewood and Wattan avenues, Detroit, Mich. (completed). Grade separation on Dequindre line, between Franklin and Hale streets, Detroit, Mich. Yard extension, Pontiac, Mich. (completed). Grade separation on diverted line South Bend, Ind. (20 per cent completed). Grade separation between California avenue and 71st street, Chicago. New ferry slip and enlargement of yard, Milwaukee, Wis.

Central of Georgia

Second Track: At Americus, Ga., 1.75 miles.

Important Work Undertaken: Completion of grade reduction and line revision, between Birmingham, Ala., and Columbus, Ga., $7,000,000 (completed). Enginehouse, Savannah, Ga., $100,000 (70 per cent completed). Hospital, Savannah, Ga., $350,000 (75 per cent completed).

Central Railroad of New Jersey

Important Work Undertaken: Third and fourth tracks, Bound Brook Jct., N. J., to Somerville, $169,669 (50 per cent completed). Shop facilities, Elizabethport, N. J., $331,159 (completed). Engine terminal, Bethlehem, Pa., $750,000 (70 per cent completed). Passenger terminal, Raritan, N. J., $619,580 (88 per cent completed). Newark Bay bridge and approaches, Bayonne and Elizabethport, N. J., $13,543,875 (90 per cent completed). Bridge, Allentown, Pa., $219,969 (completed). Grade separation, Perth Amboy, N. J., $2,000,000 (60 per cent completed). Grade separation, Somerville, N. J., $1,262,896 (91 per cent completed).

Chesapeake & Ohio

Second Track: At Westham, Va., 0.01 Harts, W. Va., to Big Creek, 5.29 miles. Limeville, Ky., to near Mile Post 2, 2.36 miles. Near Mile Post 2, Ohio, to Robbins, 15.06 miles.

Important Work Undertaken: Improvements, Ashland, Ky., to Russell, $2,579,880 (completed). Freight terminal, Clifton Forge, Va., $3,630,000 (completed). Rebuild arch and enlarge Red Hill tunnel, Callaghan, Va., $214,000 (4 per cent completed). Additional passing track, Gauley, W. Va., $215,000 (99 per cent completed). New boiler shop, Huntington, W. Va., $575,970 (completed). Improvements to engine terminal, Russell, Ky., $1,209,913 (completed).

(Chesapeake & Hocking) Construction of new line, Gregg, Ohio, to Valley Crossing, 63 miles, to be built in 1927.

Chicago & Alton

Second Track: Murrayville, Ill., to Manchester, 5.78 miles.

Important Work Undertaken: Subway, Cicero avenue, Chicago, $195,000 (10 per cent completed). Extension of yard, Bloomington, Ill., $300,000 (90 per cent completed). New grain elevator, Kansas City, Mo., $475,000 (completed).

Chicago & Eastern Illinois

Important Work Undertaken: New engine terminals, Evansville, Ind., $500,000 (completed).

Chicago & Illinois Midland

Important Work Undertaken: Rehabilitation of line from Pekin, Ill., to Springfield (formerly part of the Chicago, Peoria & St. Louis), $1,320,000 (90 per cent completed).

Chicago & North Western

First Track: Benld, Ill., to Staunton, 2.51 miles.

Important Work Undertaken: New freight yard, Proviso, Ill., $1,740,000 (completed). New l.c.l. freight transfer house, Proviso, Ill., $1,436,585 (6 per cent completed). New office building, Proviso, Ill., $357,000 (6 per cent completed). Track elevation, Mayfair (Chicago), Ill., $1,500,000 (50 per cent completed). Coal and water station, Crystal Lake, Ill., $100,000 (completed). Grain elevator, 400,000 bu. capacity, Green Bay,

Wis., $205,000 (completed). Power house Antigo, Wis., $100,000 (completed). Coaling stations, various locations, $105,700 (completed.) Water treating plants, various locations, $170,800 (completed). Logging spurs, Wakefield, Mich., and Gogebic (completed).

Chicago & Western Indiana

Important Work Undertaken: Track elevation, Dolton branch from 113th street to 131st street, including grade separation with Illinois Central at Kensington, Chicago, $1,500,000 (65 per cent completed). Elevated team yard along Canal street, between 23d and 29th streets, Chicago, $1,650,000 (35 per cent completed).

Chicago, Burlington & Quincy

Second Track: Lytle, Wis., to East Winona, 17.45 miles.
Important Work Undertaken: Feed yard facilities, Lincoln, Neb., $339,432 (completed). Installation of heavier spans on Illinois river bridge. Beardstown, Ill., $127,550 (50 per cent completed). Raising bridge and track, Harbo, Mo., $101,227 (completed). Construction of beet spur, 6 miles. Bayard, Neb., $140,409 (completed). Engine terminal facilities at various points, $254,863 (completed). Storehouse, Aurora, $535,700 (completed). Single track bridge, Chicago, $175,305 (completed). Bridge at Woodcliff, Neb., $151,736 (completed).

Chicago, Milwaukee & St. Paul

First Track: Hollandale Jct., Minn., to Hollandale, 7 miles.
Important Work Undertaken: Sewer at shops, Milwaukee, Wis., $100,000 (completed). Grain elevator, Milwaukee, Wis., $250,000 (completed). Track elevation, Chicago, $250,000 (completed). Passenger station, La Crosse, Wis., $300,000 (completed). Engine terminal, St. Paul, Minn., $1,250,000 (completed).

Chicago, Rock Island & Pacific

First Track: Amarillo, Tex., to Fritch, 37.63 miles. Billings, Okla., to Ponca City, 26.73 miles. O'Keene, Okla., to Homestead, 3.73 miles. Clark's Grove, Minn., to Maple Island, 8.67 miles.
Second Track: At Ft. Worth, Tex., 0.15 miles. At Iowa City, Iowa, 0.04 miles.
Important Work Undertaken: Track elevation on South Chicago line, Chicago, $1,200,000 (65 per cent completed). Addition to roundhouse, new shop building, store house, power house, boiler washing plant and pipe line with sump, Burr Oak, Ill., $485,000 (90 per cent completed). Coaling plants, system, $240,000 (90 per cent completed). Automatic cinder handling conveyors, systems, $130,000 (85 per cent completed). Boiler washing plants, system, $140,000 (completed). Reconstruction of bridge over White river, DeValls Bluff, Ark., $514,000 (completed).

Colorado & Southwestern

First Track: Beaver, Colo., to Little Beaver Creek, 14 miles.

Cowlitz, Chehalis & Cascade

First Track: Lacamas, Wash., to Cowlitz river, 7.5 miles.
Important Work Undertaken: Line from Cowlitz river, Wash., to Cowlitz, 6.5 miles. Line projected from Cowlitz, Wash., to Yakima, 127 miles.

Delaware, Lackawanna & Western

First Track: Kingsland, N. J., to Harrison, 6.74 miles.
Important Work Undertaken: New team delivery yard and freight house, Passaic, N. J., $237,000 (completed). New freight house, Binghamton, N. Y., $170,000 (65 per cent completed). New 1,000-ton reinforced concrete coaling plant and 1,000-ton reinforced concrete sand storage and drying plant, East Buffalo, N. Y., $137,000 (completed). Elimination of grade crossing, Bloomfield avenue, Passaic, N. J., $167,000 (completed). Elimination of grade crossing, Clinton street, Buffalo, N. Y., $309,500 (completed). Elimination of grade crossing, Colvin street, Buffalo, N. Y., $189,000 (completed). Bascule bridge over relocated channel of Buffalo river, Buffalo, N. Y., $303,000 (95 per cent completed). Renewal of bridge over Susquehanna river, Owego, N. Y., $205,000 (completed).

Denver & Rio Grande Western

First Track: Spring Canon Jct., Utah, to Kenilworth, 6.28 miles.
Important Work Undertaken: Rectification of main track alinement, various locations, $665,000 (completed). Enlargement of main line tunnels, Colorado, $120,000 (completed).

Detroit & Toledo Shore Line

Important Work Undertaken: Grade separation, Dearoad, Mich., $275,000 (80 per cent completed). Grade separation, River Rouge, Mich., joint with New York Central and Michigan Central, $600,000 (completed). Macadam road and bridge over Ottawa river to divert highway from across tracks at Lang yard, Toledo, Ohio, $102,000 (70 per cent completed).

Detroit Terminal

Important Work Undertaken: New machine shop, Davison yard, Detroit, Mich., $100,000 (completed).

Detroit, Toledo & Ironton

First Track: (Detroit & Ironton) Durban, Mich., to Petersburg, 9.87 miles.
Important Work Undertaken: Line, Petersburg, Mich., to Malinta, Ohio, 45.84 miles. Electrification, Fordson, Mich., to Flat Rock (completed).

Duluth & Iron Range

Important Work Undertaken: Remodeling ore dock No. 1, Two Harbors, Minn., $175,000 (50 per cent completed). Reconstruction of coal dock, Two Harbors, Minn., $110,000 (completed).

Duluth, Missabe & Northern

Important Work Undertaken: Grade revision between Saginaw, Minn., and Coleraine Jct., $210,000 (completed). New yard at Hall-Rust mine screening plant, Hibbing, Minn., $650,000 (completed).

Elgin, Joliet & Eastern

First Track: At Cavanaugh, Ind., and Hammond, 0.27 miles.
Second Track: Sand Pit, Ind., to Ivanhoe, 0.80 miles.

Erie

Important Work Undertaken: Freight yard facilities at 149th street and Harlem river, New York (10 per cent completed). Relocation of approximately 6.5 miles of the main track of the Greenwood Lake branch and a portion of the Ringwood branch between Wanaque, N. J., and Midvale, on account of the construction of the Wanaque reservoir by the North Jersey District Water Supply Commission (80 per cent completed). Track elevation, Jamestown, N. Y. (completed). Elimination of grade crossing of Main street, Suspension Bridge, N. Y., joint with New York Central (completed). Terminal facilities, Paterson, N. J. (35 per cent completed). Steamship and Lightering pier, Jersey City, N. J. (completed). Elimination of grade crossing Johnson City, N. Y. (completed). Relocation of highway and construction of overhead bridge, Cuba, N. Y. (15 per cent completed). Removal of state highway from close proximity to the Erie and the New York Central by the relocation of the highway and the railroads between Oil City, Pa., and Reno (30 per cent completed). Elimination of grade crossings, Akron, Ohio, joint with Pennsylvania and Baltimore & Ohio (5 per cent completed).

Florida East Coast

Second Track: Bunnell, Fla., to Daytona, 22.83 miles. Bonaventure, Fla., to Indrio, 56.30 miles. Eldred, Fla., to North Jupiter, 33.84 miles.
Third Track: Bunnell Jct., Fla., to Bunnell, 0.91 miles.
Important Work Undertaken: Relocation, Eau Gallie, Fla., to Military Park, 2.55 miles (completed). Lines under construction, Canal Point, Fla., to Belleglade, 11.1 miles, and Hialeah, Fla., to Sugar Mill, 6.6 miles. Line projected, Belleglade, Fla., to Sugar Mill, 64.8 miles. New freight terminal, Bowden, Fla., $1,231,500 (completed). Additional yard facilities, New Smyrna, Fla., $465,668 (completed). New freight terminal, Ft. Pierce, Fla., $338,488 (completed). Additional grading and tracks for freight terminal, Hialeah, Fla., $1,127,600 (completed). New freight facilities, Daytona Beach, Fla., $100,000 (completed). Additional track facilities, West Palm Beach, Fla., $207,800 (completed). Fire-proof warehouse and team tracks, Lake Worth, Fla., $100,000 (completed). Concrete warehouse, Miami, Fla., $225,000 (completed). Additional team track facilities, Miami, $111,600 (completed). Engine facilities, Bowden, Fla., $417,000 (completed). Engine facilities, St. Augustine, Fla., $1,300,000 (completed). Engine facilities, Hialeah, Fla., $463,000 (completed). Repair shops, St. Augustine, Fla., $1,000,000 (completed). General office building, third unit, St. Augustine, $223,500 (completed). Reconstruction of bridge over St. Johns river, Jacksonville, Fla., $1,855,250 (completed). Piers and abutments, Jupiter river, $100,000 (completed). New viaduct, Roseland, Fla., $718,420 (completed). Double track bridge, Tillman, Fla., $172,300 (completed). Double-track steel viaduct, Melbourne, Fla., $304,620 (completed). Double-track steel viaduct, Eau Gallie, Fla., $219,020 (completed).

Ft. Worth & Denver City

Important Work Undertaken: Lines under survey, Estelline, Tex., to Dimmitt, 132 miles. Silverton, Tex., to Lubbock, 32 miles.

Galveston Wharf Company

Important Work Undertaken: New waterfront pier and terminal, Galveston, Tex., $1,000,000 (completed).

Georgia & Florida

Important Work Undertaken: Line under survey, Augusta, Ga., to Greenwood, S. C., 56 miles.

Gulf, Mobile & Northern

Important Work Undertaken: (Jackson & Eastern) Extension of line, Lena, Miss., to Jackson, 40 miles, and rehabilitation of existing line, 32 miles. $2,000,000, under construction.

Illinois Central

Second Track: Near Waterloo, Iowa, 3.31 miles.
Important Work Undertaken: Markham yard near Homewood, Ill., $12,000,000 (completed). Grade separation, Riverdale, Ill., $2,027,000 (90 per cent completed). Grade separation and track elevation, Harvey, Ill., $3,809,000 (completed). Grade revision and other work incidental to electrification in Chicago, $5,082,000 (98 per cent completed). Electrification of suburban service, Chicago (completed). Grade separation and track elevation, Jackson, Miss., $1,928,000 (95 per cent completed). New shop facilities, Paducah, Ky., $6,378,240 (55 per cent completed). Remodeling and enlarging passenger station, Jackson, Miss., $221,500 (5 per cent completed).
(Yazoo & Mississippi Valley). New passenger station and track elevation, Clarksdale, Miss., $656,000 (50 per cent completed).

Indianapolis Union

Important Work Undertaken: Elevation of 7 miles of the Belt Railway in accordance with contract executed with the city, involving a total expenditure of $13,000,000 (2.3 per cent completed).

Kansas City Southern

Important Work Undertaken: Grade reduction and reconstruction of 6.2 miles of double track, Shreveport, La., $876,327 (22 per cent completed). Extension and improvement of engine terminals, Heavener, Okla., $127,367 (completed). Completion of joint construction with Texas & Pacific of 2.5 miles of track and bridge over Cross bayou, Shreveport, La. (completed).

Kentucky & Tennessee

First Track: Stearns, Ky., to Bell Farm, 19.68 miles.

Lehigh Valley

Third Track: At Greene Bridge, N. J., 0.29 miles.
Fourth Track: West Portal, N. J., to Bloomsburg, 1.38 miles.
Important Work Undertaken: New transfer bridge, slip, dock, dredging, etc., at East 149th street terminal, New York. (5 per cent completed). Double track tunnel to the south of the present Musconetcong tunnel (8 per cent completed). New turntable, transfer table, and extension of enginehouse stalls, Easton, Pa. (completed). Changes and extension of enginehouse, Coxton, Pa. (completed). New passenger and freight station, together with replacement of viaduct and necessary track changes, Easton, Pa. (completed). Extension of storehouse, Sayre, Pa. (completed).

Long Island

Second Track: East Rockaway, N. Y., to Long Beach, 2.96 miles.
Third Track: Fresh Pond Jct., N. Y., to Manhattan Beach Jct., 3.12 miles.
Fourth Track: Fresh Pond Jct., N. Y., to Manhattan Beach Jct., 3.92 miles.

No. 1, at Left, the Four Lift Spans of the Newark Bay Bridge of the Central of New Jersey

No. 2, Below, Highway Arch 120 ft. long on the Canton-Bayard Line of the Pennsylvania

No. 3, Highway and Railway Decks of the Santa Fe's New Mississippi River Bridge at Fort Madison, Iowa

No. 4, Muckers in the Great Northern's Cascade Tunnel

No. 5, Cut and Tunnel Portal on the Edgewood Line of the Illinois Central

No. 6, The Pennsylvania's New Ohio River Bridge at Steubenville, Ohio

Outstanding Construction Projects of 1926

Important Work Undertaken: New station building, local freight facilities and yards, Montauk, N. Y., $400,000 (15 per cent completed). Electrification of main line from Floral Park, N. Y., to Mineola, and West Hempstead branch, including new passenger station and freight yard at West Hempstead, $775,000 (95 per cent completed). Electrification of Bay Ridge branch, $2,650,000 (75 per cent completed). Purchase of two buildings to be used for freight purposes and lease and rearrangement of a portion of the Army Base tracks for team yard purposes, Bay Ridge branch, $233,500 (completed). Elimination of grade crossings, Elmhurst, N. Y., $1,000,000 (25 per cent completed).

Louisiana Railway & Navigation Company

First Track: Moreauville, La., to near Torras, 8 miles.
Important Work Undertaken: New line from Moreauville, La., to the west bank of the Mississippi river, including a steel bridge over the Atchafalaya river at Simmsport, La., $2,000,000 (75 per cent completed).

Louisville & Nashville

First Track: Kenvir, Ky., to Red Creek, 1.07 miles.
Second Track: Patio, Ky., to Ft. Estill, 23.60 miles.
Important Work Undertaken: Second track to eliminate two bridges and one tunnel to permit use of heavier power and allow movement of loads now restricted by tunnel, between Lebanon Jct., Ky., and Elizabethtown, $1,795,000 (90 per cent completed). Second track, including 2 double-track and 3 single-track tunnels and 11 bridges, between Conway, Ky., and Sinks, 12.6 miles (completing double track between Cincinnati, Ohio, and the Harlan, Ky., coal fields) $2,491,000 (5 per cent completed). Revision of line to eliminate steel viaduct, Cincinnati division $254,000 (75 per cent completed). Roundhouse and facilities, Howell, Ind., $269,844 (10 per cent completed). Steel viaduct, bridge No. 40, Cincinnati division $225,000 (90 per cent completed). Steel viaduct, bridge No. 41, Cincinnati division, $125,000 (90 per cent completed). Bridge at Rigolets, La., $3,128,000 (completed). Bridge at Chef Menteur, near New Orleans, La., $1,513,871 (completed). Superstructure for bridge over Green river, Munfordville, Ky., $330,000 (completed). Superstructure for bridge over Tennessee river, Knoxville, Tenn., $200,000 (completed). Superstructure and piers for double track crossing, Latonia, Ky., $370,000 (completed). New double track bridge, Cumberland Valley division, $300,000 (completed). New spans over Wabash river, St. Louis division, $196,000 (completed). New spans over Mobile river, Alabama, $970,000 (30 per cent completed). Filling bridges south of Louisville, Ky., $507,000 (completed).

Louisville, Henderson & St. Louis

Important Work Undertaken: Reconstruction of bridge over Green river, Spottsville, Ky., $250,000 (completed).

Lowell & Southern

First Track: Lowell, Ill., to connection with Chicago, Burlington & Quincy, one mile west of Leonore, Ill., 4 miles.

Meridian & Bigbee River

Important Work Undertaken: Line from Meridian, Miss., to Myrtlewood, Ala., 50 miles.

Minneapolis, Northfield & Southern

Important Work Undertaken: Line under construction, Superior boulevard, Minneapolis, Minn., to Crystal, 5.7 miles, $350,000 (30 per cent completed).

Minneapolis, St. Paul & Saulte Ste. Marie

Important Work Undertaken: Bascule bridge, Manitowoc, Wis., $115,000 (completed).

Minnesota Western

Important Work Undertaken: Extension of line from Lake Lillian, Minn., to Montevideo, 43 miles, $800,000 (20 per cent completed).

Missouri-Kansas-Texas

Important Work Undertaken: Construction of additional elevator storage space, increasing capacity from 1,261,600 bu. to 2,261,600 bu. Kansas City, Kan. (completed).

Missouri Pacific System

First Track: Central Branch Jct., Kan., easterly, 0.18 miles. At Halley, Ark., 0.06 miles.
(St. Louis, Brownsville & Mexico.) Raymondville, Tex., to Edinburg, 30 miles. Faysville, Tex., to Monte Christo, 10 miles. Hargill, Tex., to end of line, 10 miles.
Second Track: Washington, Mo., to Etlah, 18 miles. M. O. Jct., Mo., to Jefferson City, 3.28 miles. Alexander, Ark., to Bauxite Jct., 5 miles.
Important Work Undertaken: New line, Nashville, Ark., northerly, 7.41 miles. New line, Nashville, Ark., northwesterly, 11.83 miles. Mine spur, Zeigler, Ill., $161,000 (completed). Strengthening bridge No. 11, Wickes, Mo., $122,000 (40 per cent completed). Reconstruction of bridge No. 23, La Platte, Neb., $208,500 (65 per cent completed). Converting 300-ft. fixed span into a vertical lift span, Kragen, Ark., $174,300 (75 per cent completed). Strengthening spans, bridge No. 165, Riverton, La., $110,000 (40 per cent completed). Strengthening spans, bridge No. 171, Alexandria, La., $120,000 (75 per cent completed). Gantry crane and runways, Sedalia, Mo., $106,900 (completed). Re-arrangement of East Bottom hump yards, Kansas City, Mo., $300,000 (completed). Freight terminal, Alexandria, La., $610,000 (completed). Work house with receiving and shipping shed at K-M grain elevator, Kansas City, Mo., $550,000 (completed). Improvement of passenger terminal facilities, Hot Springs, Ark., $162,100 (completed). Addition of five stalls to engine house, Nevada, Mo., $144,700 (completed). Freight house, track scale and track changes, Omaha, Neb., $220,600 (completed). Coffeyville, Kan., freight house facilities, $101,200 (completed). Union station and re-arrangement of freight yard, Texarkana, Ark.-Tex., ownership joint with St. Louis Southwestern, Texas & Pacific and Kansas City Southern, $1,350,000 (25 per cent completed).
(St. Louis, Brownsville & Mexico.) Line projected, Raymondville, Tex., easterly, 18 miles. Additional tracks and engine terminal, Harlingen, Tex., $170,660 (80 per cent completed).
(San Benito & Rio Grande Valley.) Lines projected from near San Benito, Tex., to connection with Rio Grande City Railway, 23 miles, and from Fernando, Tex., easterly, 6 miles.
(New Orleans, Texas & Mexico.) Remodeling and enlarging shop and yard facilities, DeQuincy, La., $206,000 (completed).

Mobile & Ohio

Important Work Undertaken: Relocation and grade revision near Ava, Ill., 2.5 miles, $191,636 (75 per cent completed).

Montour

Important Work Undertaken: Relocation of line to eliminate excessive curvature, Cliff Mine, Pa., to Imperial, $225,000 (completed).

Nacogdoches & Southeastern

First Track: Oil Springs, Tex., to Calgary, 28 miles.

Nashville, Chattanooga & St. Louis

Important Work Undertaken: Remodeling passenger station, train shed and tracks, Chattanooga, Tenn., $169,000 (33 per cent completed).

New Orleans Great Northern

Important Work Undertaken: Extension of line from Nogan, Miss., to Jackson, 6.65 miles, and construction of terminals at Jackson, $1,000,000.

New York Central

First Track: (Boston & Albany) Riverside to Pine Grove, 0.11 miles.
Second Track: (Cleveland, Cincinnati, Chicago & St. Louis) Bellefontaine, Ohio, to Glen Echo, 23 miles. Gretna, Ohio, to Morgan, 7.5 miles.
Third Track: Voorheesville, N. Y., to South Schenectady, 9.30 miles. Sandusky, Ohio, to Huron, 8.27 miles.
(Pittsburgh & Lake Erie.) Fallston, Pa. to Beaver Falls, 1.47 miles.
Fourth Track: Sandusky, Ohio, to Huron, 8.31 miles.
(Pittsburgh & Lake Erie.) Fallston, Pa., to College, 3.03 miles.
Important Work Undertaken: Enlargement men's toilet and barber shop, Grand Central Terminal, New York, $264,000 (completed). New elevator and improving old elevators, Grand Central Terminal, $160,000 (67 per cent completed). Excavation and other work for Grand Central Terminal facilities, $545,000 (completed). Completion of terminal facilities under office building, New York, $1,673,000 (50 per cent completed).
Rotary equipment for sub-station, Grand Central Terminal, $322,000 (7 per cent completed). Rotary converter, 4,000 k.w., Grand Central Terminal, $122,000 (19 per cent completed). New rotary converter, 4,000 kw. at sub-station, Mott Haven, N. Y., $107,000 (19 per cent completed). Additional feeders and equipment, electric division, $124,000 (completed). Replacing cables, Port Morris, N. Y., to sub-station No. 7, $162,000 (projected). Duplicate intake tunnel at power station, Port Morris, N. Y., $235,000 (7 per cent completed). Increasing capacity of electrical apparatus in power stations, Port Morris, N. Y., and Yonkers, $344,000 (83 per cent completed). Extending boiler house, replacing boilers and installing steam line at heating plant, Mott Haven, N. Y., $220,000 (completed). Retirement of storage batteries in sub-stations, electric division, $618,000 (completed). Electrificaion of main line, Sedgwick avenue to Van Cortlandt Jct., also Yonkers branch, $1,416,000 (completed). Electrification of 30th street branch, Spuyten Duyvil, N. Y., to Harmon, N. Y., $425,000 (3 per cent completed). Elimination of Dyckman street, 30th street branch, $1,250,000 (projected). Electrification various yards and sidings, Mott Haven, N. Y., to Mt. Vernon, $123,000 (completed). Electrification various yards and sidings, Melrose, N. Y., to Port Morris, $244,000 (completed). Electrification, various yards and sidings, High Bridge, N. Y., to Croton, $318,000 (completed). Rotary converter and extension of sub-station building, White Plains, N. Y., $155,000 (19 per cent completed). Rotray converter, Mott Haven, N. Y., $107,000 (19 per cent completed). Extension of Van Cortlandt Park, Van Cortlandt Park, N. Y., $181,000 (10 per cent completed). Elimination of grade crossing Mosholu avenue, Van Cortlandt Park, $120,000 (81 per cent completed). Elimination of grade crossing between St. Clair place and 138th street, New York, $3,250,000 (32 per cent completed). Strengthening and improving bridges, Nos. H-14 and H-15, New York, $132,000 (50 per cent completed). Strengthening and improving bridge No. H-16, New York, $109,000 (completed). Freight house, team tracks and gantry crane, Port Morris, N. Y., $186,000 (completed).
Completion of Hudson River Connecting Railroad, including Selkirk yard, $24,207,000 (completed). Third and fourth tracks and reverse signaling through Weehawken tunnel, New Durham, N. J., to West Englewood, $2,368,500 (43 per cent completed). Third track, grade revision and elimination of grade crossings, Voorheesville, N. Y., to South Schenectady, $3,445,000 (66 per cent completed). Connection, main line to West Shore, and Gardenville branch to West Shore, Depew, N. Y., $1,700,000 (82 per cent completed). Terminal improvements, Buffalo, N. Y., $14,000,000 (10 per cent completed). Acquisition of abandoned Erie and Oswego canal lands, Syracuse, N. Y., $128,000 (90 per cent completed). Alterations to engine terminal, East Syracuse, N. Y., $516,000 (40 per cent completed). Alterations and additions to West Shore engine-house, East Buffalo, N. Y., $300,000 (24 per cent completed). Replacing of boilers, additional generator and crane in power house, Avis, Pa., $397,000 (90 per cent completed).
Rebuilding bridge, East Syracuse, N. Y., $257,000 (completed). Rebuilding bridge, Genesee Junction, N. Y., $111,000 (91 per cent completed). Rebuilding bridge, Woodland, Pa., $226,000 (91 per cent completed). Elimination of grade crossing, West Englewood avenue, West Englewood, N. J., $180,000 (51 per cent completed). Grade crossing elimination, Newburgh, N. Y., $438,000 (completed). Grade crossing elimination, Tarrytown, N. Y., $529,000 (completed). Grade crossing elimination, Rochester, N. Y., $453,000 (70 per cent completed). Grade crossing elimination, Oakfield, N. Y., $111,000 (91 per cent completed). Grade crossing elimination, Pittsford, N. Y., $108,000 (completed). Grade crossing elimination, Main street, Suspension Bridge, N. Y., $1,200,000 (completed).
Extension of classification yard and installation of car retarder, Gibson, Ind., $465,000 (75 per cent completed). Extension of yard and facilities, West Kankakee, Ill., $385,000 (completed). New passing track with remote switch control, Kendallville, Ind., $137,000 (completed). Extension of power house and equipment, Root street, Chicago, $145,000 (35 per cent completed). New passenger station and grade separation, Erie, Pa., $3,000,000 (65 per cent completed). New passenger station, Youngstown, Ohio, $400,000 (completed). Grade separation, new freight house and tracks, South Bend, Ind., total cost $8,000,000, present authority $1,125,000 (15 per cent completed). Grade separation, Fairview, Pa., $118,000 (30 per cent completed). Grade separation, Conneaut, Ohio, $415,000 (10 per cent completed). Grade separation, Ashtabula, Ohio, $270,000 (75 per cent completed). Grade separation, Cleveland, Ohio, $190,000 (25 per cent completed). Grade separation, Sandusky, Ohio, $350,000 (80 per cent completed). Grade separation, Toledo, Ohio, $230,000 (completed). Grade separation, River Rouge, Mich., New York Central proportion, $125,000 (15 per cent completed). Grade separation, Detroit, Mich., $300,000 (completed). Grade separation, New Carlisle, Ind., $100,000 (completed). Grade separation, Grand Avenue, Gary, Ind., $250,000 (60 per cent com-

pleted). Relocation of track and state highway to improve alinement and eliminate two grade crossings between Oil City, Pa., and Reno, New York Central proportion $100,000 (15 per cent completed).

(Ohio Central Lines.) Yard tracks and yard office, Moline, Ohio, $405,000 (completed). Car dumper, Toledo, Ohio, $1,226,000 (completed).

(Boston & Albany.) New station and facilities, Springfield, Mass., $4,000,000 (completed). Reduction of curvature and additional main track, Warren, Mass., to West Warren, $400,000 (75 per cent completed).

(Michigan Central.) Improvements at l.c.l. freight terminal, Detroit Mich., $1,863,825 (completed). Freight houses, tracks, and driveways, Detroit, $191,600 (completed). New power plant for enginehouse and shops, Detroit, Mich., $222,400 (completed). Grade separation, River Rouge, Mich., $102,300 (completed). Grade separation near Detroit, Mich., $157,450 (completed).

(Cleveland, Cincinnati, Chicago & St. Louis.) Second track, Rapp, Ind., to Vance, two miles, and Hart, Ind., to Williams, one mile, $225,000 (projected). Westbound receiving yard and addition to classification yard, Sharonville, Ohio, $1,241,000 (projected). Engine terminal and extension of yard, Riverside, Ohio, $2,850,000 (7 per cent completed). Main track connection, Donnelsville-Cold Springs, Ohio, $150,000 (65 per cent completed). Engine terminal, Kankakee, Ill., $264,000 (completed). Grade separation, Columbus, Ohio, $302,000 (completed).

(Pittsburgh & Lake Erie.) Construction third and fourth main tracks between Fallston, Pa., and College, $670,000 (completed). Enlargement of freight terminal facilities, East Carson street yard, Pittsburgh, Pa., $300,000 (90 per cent completed). Improvements in terminal freight house, Pittsburgh, Pa., $100,000 (75 per cent completed). New freight house, tracks and driveways, Ellwood City, Pa., $200,000 (90 per cent completed). Enlargement and revision of west yard, East Youngstown, Ohio, $153,000 (completed). Enlargement and revision of yard, Becks Run, Pa., $505,000 (40 per cent completed). Slag fill for proposed yard, Glassport, Pa., $145,000 (40 per cent completed). Replacing one 70-ft. turntable and one 90-ft. turntable with two 110-ft. turntables, McKees Rock, Pa., $109,000 (completed). Relocation of highway and construction of overhead bridge to eliminate a grade crossing between West Economy, Pa., and Woodlawn, $218,000 (80 per cent completed). Elimination of grade crossing at McKeesport, Pa., P. & L. E. proportion $110,200 (15 per cent completed).

(Indiana Harbor Belt.) Line under survey, Blue Island, Ill., to LaGrange, 16 miles. Additional tracks and facilities, and purchase of right of way, Blue Island yard, $375,000 (completed). Extension of eastbound yard, Blue Island, Ill., $900,000 (completed). Track elevation, Kedzie avenue, Chicago, and new tracks, 55th street, Chicago to Elsdon, Ill., $340,000 (80 per cent completed). Grade separation, Riverdale, Ill., $170,000 (20 per cent completed).

(Chicago Junction.) Track elevation, Kedzie avenue, Chicago, $200,000, (completed).

New York, Chicago & St. Louis

Second Track: East of Lorain, Ohio, 2 miles. Ashtabula, Ohio, to Madison, 14 miles.

Important Work Undertaken: Grade revision, Sorento, Ill., $250,000 (75 per cent completed). Machine shop, Frankfort, Ind., $115,000 (90 per cent completed).

New York Connecting

Important Work Undertaken: Completion of electrification, Port Morris, N. Y., to Fresh Pond Junction, $500,000 (75 per cent completed).

New York, New Haven & Hartford

First Track: At Collinsville, Conn., 0.15 miles. At Saybrook, Conn., 0.23 miles.

Third Track: At Attleboro, Mass., 0.20 miles.

Fourth Track: At Attleboro, Mass., 0.22 miles.

Important Work Undertaken: Dam, pipe line, etc., for water for power house, Cos Cob, Conn., $550,000 (20 per cent completed). Replacement of turbo-generator equipment, Cos Cob, $869,000 (completed). Replacement of switching equipment, Cos Cob, $550,000 (completed). Additional boiler equipment, Cos Cob, $400,000 (10 per cent completed). Frequency changer set at station "A" of street railway to permit taking of power for electrified zone, $308,000 (65 per cent completed). Additional tracks in classification yard and car retarders, Hartford, Conn., $550,000 (completed). Additional tracks Cedar Hill Yard, New Haven, Conn., $248,500 (completed). Additional yard tracks, South Worcester, Mass., $355,000 (completed). Revision of passenger yard tracks, Springfield, Mass., $152,000 (50 per cent completed). Bulk tracks, 16,400 ft. and 22,400 sq. yds. concrete driveways, with electric crane, Harlem River, N. Y., $213,000 (completed). Construction of seven additional classification tracks and 150-ton track scale, Harlem River, $135,000 (80 per cent completed). Repairs and extension of lighterage facilities, Harlem River, $120,000 (75 per cent completed). Revision of freight houses No. 5, 10, and 11 and yard produce terminal, Boston, Mass., $150,000 (completed). Extension of facilities for repair of electrical equipment, Van Ness, N. Y., $735,000 (completed). Overhead crane and extension of car repair shop, etc., New Haven, Conn., $204,000 (completed). Shed for freight car repairs and rebuilding machine shop, East Hartford, Conn., $133,400 (completed). Extension and construction of shops, Readville, Mass., $405,000 (completed). Addition to enginehouse and new turntable, water tank, coal pockets and cinder plant, Lowell, Mass., $205,000 (completed). Engine house, 10 stalls, with turntable and coal, water and cinder facilities, Fall River, Mass., $272,000 (completed). Extension to engine house and shops, New Bedford, Mass., $260,000 (95 per cent completed). Highway bridge over six tracks, eliminating four crossings, Saybrook, Conn., $160,000 (completed).

Norfolk & Western

Second Track: West Virginia, 2.65 miles.

Important Work Undertaken: Extension of sidings, various locations, $317,000 (completed). Extension of sidings various locations, $922,555 (40 per cent completed). Extension of yards, Williamson, W. Va., $1,637,500 (50 per cent completed), and Portsmouth, Ohio, $3,580,760 (50 per cent completed). Bridge extensions and improvements, various locations, $133,641 (completed). Culvert extensions, Dry Fork branch, $188,500 (completed). Bridge extensions and improvements, various locations, $451,802 (25 per cent completed). Culvert extensions, various locations, $484,500 (45 per cent completed). Passenger and freight facilities, various locations, $277,250 (completed). Shop buildings, various locations, $496,180 (completed). Shop buildings, Roanoke, Va., $365,000 (54 per cent completed). Shop buildings, Williamson, W. Va., $1,369,100 (54 per cent completed). Shop buildings, Portsmouth, Ohio, $568,440 (54 per cent completed). Water supplies, various locations, $168,750 (completed). Water supplies, various locations, $229,900 (15 per cent completed). Elimination of grade crossings, various locations, $2,608,611 (40 per cent completed).

Northern Pacific

First Track: Orofino, Idaho, easterly, 9.9 miles.

Important Work Undertaken: New line, Mile Post 10, Idaho to Headquarters, 31 miles. Grade separation. Minneapolis, Minn., $250,000 (completed). Reconstruction of bridge across Mississippi river, Minneapolis, Minn., $300,000 (30 per cent completed). Reconstruction of bridge over North Fork of Clearwater river, Ahsahka, Idaho, $116,000 (10 per cent completed). Freight house and terminals and fruit warehouse, Spokane, Wash., $372,500 (completed). Reconstruct bridge, city waterway, Tacoma, Wash., $100,000 (15 per cent completed).

Oklahoma & Rich Mountain

First Track: Page, Okla., to Pine Valley (Muse), 17 miles.

Orange & Fredericksburg

First Track: At Orange and Fredericksburg, Va., 0.79 miles.

Important Work Undertaken: Widening to standard gage from Fredericksburg, Va., to Orange, 38 miles, $200,000 (completed).

Pennsylvania

Second Track: At Springfield, N. Y., 1.25 miles. At Oil City, Pa., 3.53 miles. At Johnstown, Pa., 0.57 mile. At East Liberty, Pa., 0.05 mile. Carrothers, Ohio, to Bloomville, 6.07 miles. Gibsonburg, Ohio, to Woodville, 6 miles. Wights, Ohio, to Woodville, 4.60 miles. At Delaware, Ohio, 0.71 mile. At Marion, Ohio, 0.65 mile. At Chicago, 0.28 mile.

Important Work Undertaken: Double track line from 58th street, Philadelphia, Pa., to junction with Chester & Philadelphia branch near Hog Island shipyard, $2,560,000 (96 per cent completed). Low grade freight line, Canton, Ohio, to Bayard, $4,400,000 (98 per cent completed). Single track line to Pittsburgh Plate Glass Company at Fultonham, Darlington, Ohio, $250,000 (completed). Freight tracks, Weirtown Jct., W. Va., to Collier, $240,000 (12 per cent completed). Relocation of tracks, Renovo, Pa., to Keating, $135,000 (10 per cent completed). Relocation of main line through Beaver Falls, Pa., $3,040,000 (97 per cent completed). Second track and grade reduction, Casey, Ill., to Shoyer, $605,000 (completed). Second track and grade reduction. Shoyer, Ill., to Montrose, $2,155,000 (50 per cent completed). Second track and grade reduction, Pierron, Ill., to St. Jacob, $905,000 (98 per cent completed). Second track and grade reduction, St. Jacob, Ill., to Collinsville, $2,400,000 (10 per cent completed). Track connection between C. & P. and Wheeling divisions, Yellow Creek, Ohio, $445,000 (completed). Grading and masonry for change of line and grade, Glen Osborne, Pa., to Shields, $330,000 (5 per cent completed). Transfer of old line to second track of new line, Delaware, Ohio, $275,577 (completed). Purchase of property for 16.2 miles second track, Charlottesville, Ind., to Philadelphia, $227,800 (completed).

American Railway Express Terminal, Long Island City, N. Y., $2,512,000 (80 per cent completed). Additional tracks, pipe trenches, etc., Sunnyside yard, Long Island City, $180,000 (completed). Battery charging facilities to serve passenger tracks. Sunnyside yard, Long Island City, $118,069 (completed). Pipe trenches, extension of pipe tunnel and extension of buildings and platforms, Sunnyside yard, $147,000 (completed). Track changes and additional tracks, Waverly yard, Newark, N. J., $185,000 (completed). Increasing capacity and two additional pull through tracks, Pavonia yard, Camden, N. J., $327,000 (completed). Produce yard, South Philadelphia, Pa., $2,120,000 (15 per cent completed). Extension of four receiving tracks in 59th street yard, Philadelphia, Pa., $298,555 (completed). Two new 62 ft. scales with mechanical hump and revision of classification yard, East Altoona, Pa., $348,000 (75 per cent completed). Additional tracks, Woodvale yard, Conemaugh, Pa., $121,000 (10 per cent completed). Storage yard, Massillon, Ohio, $130,000 (completed). Additional yard facilities, Mingo Junction, Ohio, $471,000 (52 per cent completed). Additional storage tracks, East Weirton, W. Va., $125,000 (completed). Additional storage tracks, Weirton Junction, W. Va., $410,000 (85 per cent completed). Extension of passing track, Broadacre, Ohio, $147,500 (50 per cent completed). Extension of passing track, Miller, Ohio, $176,000 (75 per cent completed). Extension of passing track, Conesville, Ohio, $140,000 (completed). Extension of passing track, Black Run, Ohio, $135,000 (completed). Additional yard facilities, Bay Junction, Ohio, $175,137 (completed). Rearrangement of coach yard facilities, Chicago, $227,400 (completed). Receiving tracks, Grogan yard, Columbus, Ohio, $360,000 (16 per cent completed). Purchase of property for departure yard, Columbus, Ohio. $100,000 (completed).

Reconstruction of 32d street tunnel, Philadelphia, Pa., $970,000 (55 per cent completed). Reconstruction of bridge over Ohio river, Steubenville, Ohio. $1,945,000 (completed). Reconstruction of bridge, York, Pa., $106,200 (completed). Reconstruction of overhead bridge, Altoona, Pa., $100,000 (85 per cent completed). Reconstruction of undergrade bridge, Portage, Pa., $170,000 (completed). Reconstruction of bridge over Chesapeake & Delaware Canal, Canal, Del., $275,000 (93 per cent completed). Renewal of bridge No. 83.15 with double-track structure, Toledo, Ohio, $159,369 (completed). Renewal of bridge No. 82.72 Toledo, Ohio, $166,880 (31 per cent completed). Replacing 24 spans timber trestle and 4 spans through truss with 18 spans deck plate girders, north of Seymour, Ind., $172,000 (30 per cent completed). Replacing deck truss bridge with deck plate girders on reinforced concrete masonry, Monticello, Ind., $221,820 (50 per cent completed). Reconstruction of bridge over Lehigh avenue, Philadelphia, Pa., $150,000 (completed). Reconstruction of overhead bridges at 41st street and 59th street, Philadelphia, $585,000 (projected). Overhead bridge, Market street, Marcus Hook, Pa., ¾ cost, $305,000 (32 per cent completed).

Track elevation, South Philadelphia, Pa., $25,000,000 (30 per cent completed). Grade separation, Manor, Pa., $190,000 (30 per cent completed). Grade separation, Baltimore, Md., $114,595 (22 per cent completed). Grade separation, Dixmont, Pa., to Glenfield, $385,000 (85 per cent completed). Grade separation, Columbus, Ohio, $345,000 (75 per cent completed). Track elevation, Cleveland, Ohio, $2,985,000 (97 per cent completed). Subway, Ashtabula, Ohio, $225,000 (80 per cent completed). Grade separation, Akron, Ohio, $860,000 (10 per cent completed). Overhead bridge, Red Bank, Ohio, $7,145,000 (35 per cent completed). Undergrade bridge, Ft. Wayne, Ind., $1,235,000 (completed). Concrete viaduct 1,517 ft. long over tracks of Pennsylvania, Michigan Central and Pere Marquette, Grand Rapids, Mich., $300,000 (completed). Relocating Grant street and widening Seventh avenue and Cherry street, Pittsburgh, Pa., $580,000 (completed).

Office building, first unit, Philadelphia, Pa., $3,300,000 (75 per cent completed). Enlargement of Long Island waiting room and additional facilities, Pennsylvania station, New York, $153,000 (30 per cent completed). Additional ticket offices, parcel rooms, etc., Pennsylvania station, New York, $190,000 (30 pr cent completed). Enlarging facilities, Journal Square station, Jersey City, N. J., $745,000 (32 per cent completed). Fitting up Rosenthal building for dining car commissary, Columbus, Ohio, $110,000 (completed). Relocation and rearrangement of American Railway

Express facilities in freighthouse, Chicago, $180,080 (projected). Tank car repair shop, Altoona, Pa., $900,000 (15 per cent completed). Additional boilers at power plant, East Altoona, $122,000 (12 per cent completed). Scrap handling plant, including tracks, buildings and equipment, Lucknow, Pa., near Harrisburg, $313,000 (completed). Mechanical coaling station and ash pits, Conemaugh, Pa., $337,000 (95 per cent completed). Improved locomotive facilities for passenger locomotives, Eastern division, Pittsburgh, Pa., $150,000 (completed). Smoke exhaust and washing system at 55th street engine terminal, Chicago, $229,460 (20 per cent completed). Improvement for water supply, Enola, Pa., $110,000.

Elctrification, Philadelphia, Pa., to Wilmington, Del., $6,890,000. Electrification, Philadelphia, Pa., to West Chester, $3,165,000, projected for 1927.

Pere Marquette

Second Track: At Grand Rapids, Mich., 0.74 miles.

Important Work Undertaken: Extension of Oak yard, Detroit, Mich., $189,000 (completed). Separation of grades, Plymouth road, Detroit, Mich., $101,072 (completed). New yard, McGrew, Mich., $167,000 (50 per cent completed).

Port Angeles Western

Important Work Undertaken: Location survey made. Tyee Lake, Wash., to Forks, 9 miles.

Pullman Railroad

Important Work Undertaken: Grade separation and new interchange yard at 95th street, Chicago, $250,000 (completed).

Quanah, Acme & Pacific

First Track: At Port Clinton, Pa., 0.15 miles. At Newcastle, Pa.,

Important Work Undertaken: Line projected, McBain, Tex., to Floydada, 27 miles.

Reading

Second Track: At Port Clinton, Pa., 0.05 miles. Westwood, Pa., to Silverton, 1.92 miles.

Third Track: Robesonia, Pa., to Womelsdorf, 2.56 miles.

Important Work Undertaken: Freight house and office building, Lebanon, Pa., $173,000 (completed). Additional yard tracks, East Penn Jct., Pa., $170,000 (completed). Ore handling machinery, power equipment and track work Port Richmond (Philadelphia), Pa., $775,000 (completed). Two 10-ton electric revolving gantry cranes on Pier "H," also extension of pier 727 ft., with necessary dredging and filling, Port Richmond, Pa., $280,000 (5 per cent completed). Reinforced concrete grain elevator, 2,500,000 bu. capacity, together with shipping pier and dredging of docks, Port Richmond (60 per cent completed). Perishable products warehouse, including tracks, driveways and sheds, Philadelphia, Pa. (cost divided with Baltimore & Ohio) $3,500,000 (95 per cent completed). New shop facilities, Reading, Pa., $712,000 (80 per cent completed). Steel frame car repair shop and engine terminal facilities, Reading, Pa., $2,014,000 (completed). Office building, Philadelphia, Pa., $890,000 (completed). Y. M. C. A. building, Reading, Pa., $275,000 (7 per cent completed). Change of alinement to eliminate viaduct, 120 ft. high and 1,100 ft. long, Ringtown, Pa., $1,000,000 (90 per cent completed). Change of alinement, involving change of channel of Schuylkill river, Port Clinton, Pa., $700,000 (completed). Extending bridge for third and fourth tracks, Hummelstown, Pa., $384,000 (40 per cent completed). Replacement of double-track brick arch with double-span concrete box for four tracks $105,000 Hummelstown, Pa. (50 per cent completed). Grade crossing elimination, Manayunk (Philadelphia), Pa., cost divided with city of Philadelphia, $4,500,000 (1 per cent completed). Replacement of stone arch over Rising Sun avenue, Philadelphia, with plate girder bridge, cost divided with the city, $116,000 (73 per cent completed). Replacement of through truss open-floor bridge with through plate girder solid floor bridge, Port Clinton, Pa., $151,000 (80 per cent completed).

Richmond, Fredericksburg & Potomac

Important Work Undertaken: Double track concrete arch bridge over Rappahannock river and track elevation eliminating four grade crossings, Fredericksburg, Va., $1,000,000 (80 per cent completed). Low grade freight line, passing under two passenger lines, Potomac Yard, Va., $160,000 (completed).

St. Louis-San Francisco

First Track: Browningtown, Mo., to Deepwater, 2.9 miles.

Important Work Undertaken: Line under construction, Aberdeen, Miss., to Aliceville, Ala., 57 miles. Line projected, Aliceville, Ala., to Kimbrough, 95 miles.

(Kansas City, Fort Scott & Memphis.) Extension of engine terminal facilities, Kansas City, Mo., $159,000 (completed). Strengthening Mississippi river bridge to carry heaviest locomotives, Memphis, Tenn., $203,000 (completed). New passenger station and facilities, Springfield, Mo., $310,000 (90 per cent completed).

(Muscle Shoals, Birmingham & Pensacola.) Rehabilitation of line, Kimbrough, Ala., to Pensacola, Fla., $2,225,000 (75 per cent completed).

Seaboard Air Line

First Track: (Seaboard All-Florida) West Palm Beach, Fla., to Miami, 70.5 miles. Ft. Ogden, Fla., to Naples, 68.3 miles.

Second Track: Baldwin, Fla., to Starke, 26 miles. Wildwood, Fla., to Coleman, 5.5 miles. Yeomans, Fla., to Tampa Northern Junction, 2.5 miles.

Important Work Undertaken: New Yeomans yard, Tampa, Fla., $130,000 (80 per cent completed). Extension of yard, Baldwin, Fla., $200,000 (completed). Extension of yard, Wildwood, Fla., $130,000 (completed). New yard and shop facilities, Indiantown, Fla., $400,000 (completed).

(Seaboard All-Florida) Lines under construction, Ft. Myers, Fla., to LaBelle, 30.7 miles and Punta Rassa Junction, Fla., to Punta Rassa, 8.6 miles. Line projected, Miami, Fla., to Florida City, 30 miles.

Southern

Second Track: Salisbury, N. C., to Majolica, 4.5 miles. Hayne, S. C., to Sigsbee, 2.5 miles.

Important Work Undertaken: Office building, Charlotte, N. C., $198,000 (completed). Car repair facilities, Coster shops, Knoxville, Tenn., $304,000 (completed). Freight yard, Chattanooga, Tenn., $1,450,000 (95 per cent completed). East Third street viaduct, Chattanooga, Tenn., $305,000 (35 per cent completed). Passenger station, Greensboro, N. C., $1,171,000 (85 per cent completed). Industrial belt line, Birmingham, Ala., $252,000 (50 per cent completed). Water supply, Spencer, N. C., $212,000 (70 per cent completed).

Southern Pacific

First Track: (Arizona Eastern.) Wellton, Ariz., to Hassayampa, 96.67 miles. Pozo Jct., Ariz., to Picacho, 49.03 miles.

(Central Pacific.) Cascade Summit, Ore., to Pryor, 35.92 miles. Black Butte, Cal., to Grass Lake, 23.74 miles. Black Butte, Cal., to Igerna, 1.54 miles.

(Morgan's Louisiana & Texas Railroad & Steamship Company.) End of plantation spur to Milton, La., 4.40 miles. Plantation spur extension to Youngsville, La., 3.68 miles.

(Southern Pacific Lines in Texas.) Falfurrias, Tex., to Edinburg, 64.10 miles. Edinburg to Harlingen, 32.40 miles.

Scond Track: Dome, Ariz., to Wellton, 17.54 miles. California-Arizona State Line to east of Yuma, Ariz., 5.08 miles. California-Arizona State Line to west end of Yuma bridge, 0.06 miles. West of Mescal, Ariz., 0.41 miles. At Phoenix, Ariz., 1.41 miles.

Important Work Undertaken: Construction of freight spur into an orchard district, 6.3 miles, at Marysville, Cal. Second track between San Luis Obispo, Cal., and Hadley (5 per cent completed). New freight yard, Santa Clara, Cal. (90 per cent completed). Additional yard tracks and facilities, Roseville, Cal. (80 per cent completed). New freight yards and engine terminal, Klamath Falls, Ore. (70 per cent completed). Storage yard in industrial district, San Francisco, Cal. (50 per cent completed). New freight station and facilities, Bakersfield, Cal. (10 per cent completed). Auto ferry slip, Oakland, Cal. (completed). Reinforcing steel bridge over Rio Grande river, El Paso, Tex. (10 per cent completed).

(Morgan's Louisiana & Texas Railroad & Steamship Company.) Fruit, warehouse and tracks, New Orleans, La., $165,520 (10 per cent completed). Dirt pit tracks and storage tracks of Houma, La., $212,000 (completed).

(Texas & New Orleans.) Waterfront terminal development on Houston Ship Channel, Clinton, Tex., $1,056,121 (completed). Additional yard tracks, Englewood, Tex., $113,973 (completed).

(Galveston, Harrisburg & San Antonio.) Relocation of 9.36 miles of main track between Langtry, Tex., and Osman, $874,398 (90 per cent completed).

(Houston & Texas Central.) Belt line around Dallas, Tex., $1,853,543 (completed). New freight station, with tracks, Dallas, $675,900 (completed). Rehabilitation and expansion of engine terminal facilities, Houston, Tex., $120,087 (completed). Inbound and outbound freight house, Houston, $683,560 (completed). New terminal yard and facilities, Miller, Tex., $256,227 (completed). New engine terminal facilities, Miller, $290,000 (60 per cent completed).

(San Antonio & Aransas Pass.) Line under construction, Edinburg, Tex., to the Mexican border, 15.8 miles. Reconstruction of yard, Houston, Tex., $135,176 (5 per cent completed). New passing tracks and extensions of old passing tracks, Skidmore, Tex., to Falfurrias, $140,120 (10 per cent completed).

(Houston & Shreveport.) Extend yard and construct overhead crossing with Kansas City Southern, $335,684 (projected).

Terminal Railroad Association of St. Louis

Important Work Undertaken: Coach yard, St. Louis, Mo., $1,000,000 (completed). Additional tracks and re-arrangement of Madison yard, Venice, Ill., $144,000 (completed). Additional tracks and roadways, St. Louis, Mo., $132,000 (80 per cent completed). Additional tracks and roadways, East St. Louis, Ill., $133,000 (83 per cent completed).

Texas & Pacific

Important Work Undertaken: Completion of yard and engine terminals, constructed jontly with Missouri Pacific, Alexandria, La., $1,000,000 (completed). Completion of yard and engine terminal, Dallas, Tex., $850,000 (completed).

Texas Pacific-Missouri Pacific Terminal of New Orleans

First Track: At New Orleans, La., 0.58 miles.

Important Work Undertaken: Classification yard and engine terminal facilities, Gouldsboro, La., $1,712,750 (40 per cent completed). Rearranging and enlarging yard, New Orleans, La., $132,000 (completed).

Toledo Terminal

Second Track: At Toledo, Ohio, 3.26 miles.

Union Pacific System

First Track: (Union Pacific) Gering, Nebt., to Redford, and Lyman, Neb., to Sears, 11.85 miles, Yoder, Wyo., to Creighton and Cattier, Wyo., to South Torrington, 12.59 miles, Ripple, Colo., to Orcutt, 2.35 miles.

(Oregon Short Line.) Rogers, Idaho, to Wells, Nev., 93.18 miles.

Second Track: (Union Pacific.) Echo, Utah, to Gateway, 25.80 miles.

Important Work Undertaken: (Union Pacific.) Extension and revision of classification and storage yards, Omaha, Neb., $220,000 (completed). New passenger station and freight depot, Topeka, Kan., $400,000 (95 per cent completed). Viaduct, Kansas City, Kan., $254,000 (completed). Replacing bridge No. 22.60 near Perry, Kan., $189,000 (90 per cent completed). Subway on 38th St., between Walnut and Wyncoop streets, Denver, Colo., (U. P. proportion of cost), $160,000 (75 per cent completed).

(Oregon Short Line.) Moving station facilities and re-arrangement of main tracks and sidings, American Falls, Idaho, $363,800 (completed).

(Los Angeles & Salt Lake.) Reinforced concrete viaduct over Los Angeles river, L. A. & S. L., and A. T. & S. F. tracks, at Macy street, Los. Angeles, Cal. (L. A. & S. L. proportion), $135,000 (completed). Reinforced concrete viaduct across Los Angeles river, L. A. & S. L. and A. T. & S. F. tracks at Seventh street, Los Angeles (L. A. & S. L. proportion), $535,000 (20 per cent completed). Grade separation at Downey road, Los Angeles (L. A. & S. L. proportion), $153,000 (10 per cent completed). Trackage with necessary street and sewerage improvements, to serve Metropolitan Warehouse District, Los Angeles, Cal., $120,000 (25 per cent completed). Grade separation at Whittier boulevard, Pico, Cal. (L. A. & S. L. proportion), $130,000 (completed). Trackage with necessary street and sewerage improvements to serve Harbor District, Wilmington, Cal., $431,000 (20 per cent completed). Enlarge and reline 228 lin. ft. of tunnel No. 16, between Big Springs, Nev., and Islen, $162,000 (completed). Enlarge and reline 291 lin. ft. of tunnel No. 18 between Brown, Nev., and Acoma, $100,000 (25 per cent completed).

Virginian

First Track: At Mullens, Va., 0.04 miles.

Important Work Undertaken: Completion of electrification of 134 miles of main track from Mullens, Va., to Roanoke, $11,143,600 (completed).

Wabash

Second Track: Seneca, Mich., to Adrian, 9.2 miles.

Important Work Undertaken: Grade separation, Detroit, Mich., $122,476 (completed). Extension of inbound freighthouse, Detroit, Mich., $105,000 (completed). Rearrangement of 17th street yard, Detroit, Mich., $227,964 (completed). New dock wall, Detroit, Mich., $140,518 (completed). New storehouse, Oakwood, Mich., $102,000 (completed). Extension of yard, Montpelier, Ohio, $163,300 (completed). Reconstruction of bridge over Sangamon river, Decatur, Ill., $850,000 (60 per cent completed). Addition to locomotive shop, Decatur, Ill., $1,100,000 (completed). New office building, Decatur, Ill., $100,000 (completed). Second track, Adrian, Mich., to Britton, 12 miles, $850,000 (25 per cent completed).

Western Pacific

Important Work Undertaken: New tracks to develop new industrial district, San Francisco, Cal., $175,000 (completed). Passing track extensions, various locations, $102,000 (completed). Yard tracks, various locations, $118,000 (completed). Replacing timber trestles with permanent structures, various locations, $263,000 (completed).

Winston-Salem Southbound

Important Work Undertaken: Relocation of line on account of hydro-electric development at High Rock, N. C., $500,000 (25 per cent completed).

Winston-Salem Terminal

Important Work Undertaken: Completion of union passenger station used jointly by the Southern, Norfolk & Western and Winston-Salem Southbound, Winston-Salem, N. C., $840,000 (completed).

Yosemite Valley

Important Work Undertaken: Relocation of main line between Merced Falls, Cal., and Detwiler, 16.7 miles (completed).

Railway Construction in Canada

Canadian National

First Track: St. Remi d'Amherst, Que., 2.3 miles. Pine Falls branch, Man., 5.2 miles. Bencough to Willow Bunch, Sask., 19.8 miles. Dunblane to Central Butte, Sask., 1.4 miles. Tuttleford, Sask., southeasterly, 42.2 miles. Arcadia Valley, Sask., 12 miles. Arcadia Valley, Alta., 12.6 miles. St. Paul, Alta., southeasterly, 21 miles.

Important Work Undertaken: Construction of steel transit sheds at ocean terminals, Halifax, N. S., (completed). Standardization of gage on 143 miles of line on Prince Edward Island. Erection of steel train shed, St. John, N. B. New yard and engine facilities, Jonquiere, Que. New engine and car facilities and new freight yard, Toronto, Ont. New yard near Clifton Junction, Ont., with connecting track to the Wabash division. Three-track ferry slip, Windsor, Ont., (completed). Replacing timber trestle at Mile 32.9, Amos subdivision, with steel viaduct 871 feet long (completed). Reconstruction of hotel destroyed by fire at Minaki, Ont. Construction of new connection, 3.97 miles long, between the Canadian Northern and the Grand Trunk Pacific main lines near Solomon, Alta., and the rehabilitation of the Grand Trunk Pacific between the point of connection and Obed, Alta. Additions and improvements to Jasper Park Lodge, Alta., (completed). Filling timber trestle, Mile 17.1, Clearwater subdivision, Alta. Extending roadway and installing sewer, Vancouver, B. C., (completed).

Canadian Pacific

First Track: Lloydminster, Alta., to Wellsdale, 40.8 miles. Cardston, Alta., to Glenwoodville, 28.3 miles. Fife Lake Branch, Sask., 45.5 miles. Unwin, Sask., to Lloydminster, 30.6 miles. Assiniboia, Sask., Southerly, 13.5 miles. Bromhead, Sask., westerly, 30 miles. Melfort, Sask., northerly, 7.5 miles.

Important Work Undertaken: Line diversion, Chelsea, Que., to Cascades, 6 miles (completed). Renewal of substructure, Prince of Wales bridge, Ottawa, Ont., $600,000 (completed). Replacement of bridge No. 1.3 for heavier power, Red Deer subdivision, Alta., $110,000 (completed). Reconstruction of burnt portions of Chateau Frontenac Hotel, Quebec, Que., $1,500,000 (completed). New wing to Banff Springs Hotel, Banff, Alta., $2,000,000 (50 per cent completed). New hotel at Regina, Sask., $2,000,000 (50 per cent completed). New pier at Vancouver, B. C., $5,000,000 (95 per cent completed).

Lacombe & North Western

First Track: Hoadley, Alta., to Breton, 22.2 miles.

Michigan Central

Important Work Undertaken: Extension of enginehouse and boiler house, Windsor, Ont., $127,450. (50 per cent completed).

Toronto, Hamilton & Buffalo

Important Work Undertaken: Completion of rock excavation for realinement and future double track between Stoney Creek, Ont., and Vinemount, $166,000 (completed).

Railway Construction in Mexico

El Oro Mining & Railway Company

First Track: Palizada, Mex., to Salitre, 7.5 miles.

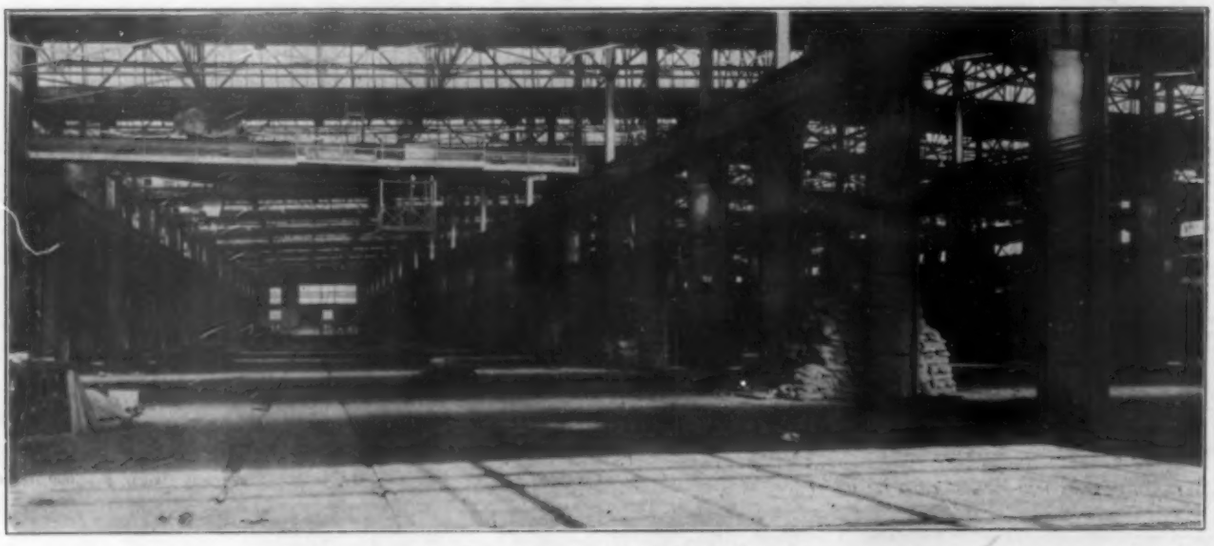
Mexican Railway

Important Work Undertaken: Completion of electrification from Orizaba, Vera Cruz, to Cordoba, 16.38 miles (completed).

Southern Pacific Railroad of Mexico

First Track: Gracia, Nayarit, to Portezuelo 5 miles. End of track, Jalisco, to Portezuelo, 15 miles.

Important Work Undertaken: Reconstruction of Tonichi branch, Sonora, 97 miles, destroyed in the revolution, $220,000 (98½ per cent completed). Reconstruction of Alamos branch, Sonora, 38 miles, destroyed in the revolution (97 per cent completed). Reconstruction of 18 miles of grading and bridges for the main line in Sonora, destroyed in the revolution and by washouts, $330,000 (99 per cent completed). New bridge over Morocito river, Sinaloa, $313,000 (completed).



The Interior of the West Side of the Reading's New 128-Car Capacity Freight Car Repair Shop at Reading, Pa., Just Before Completion

Railway Finances in 1926

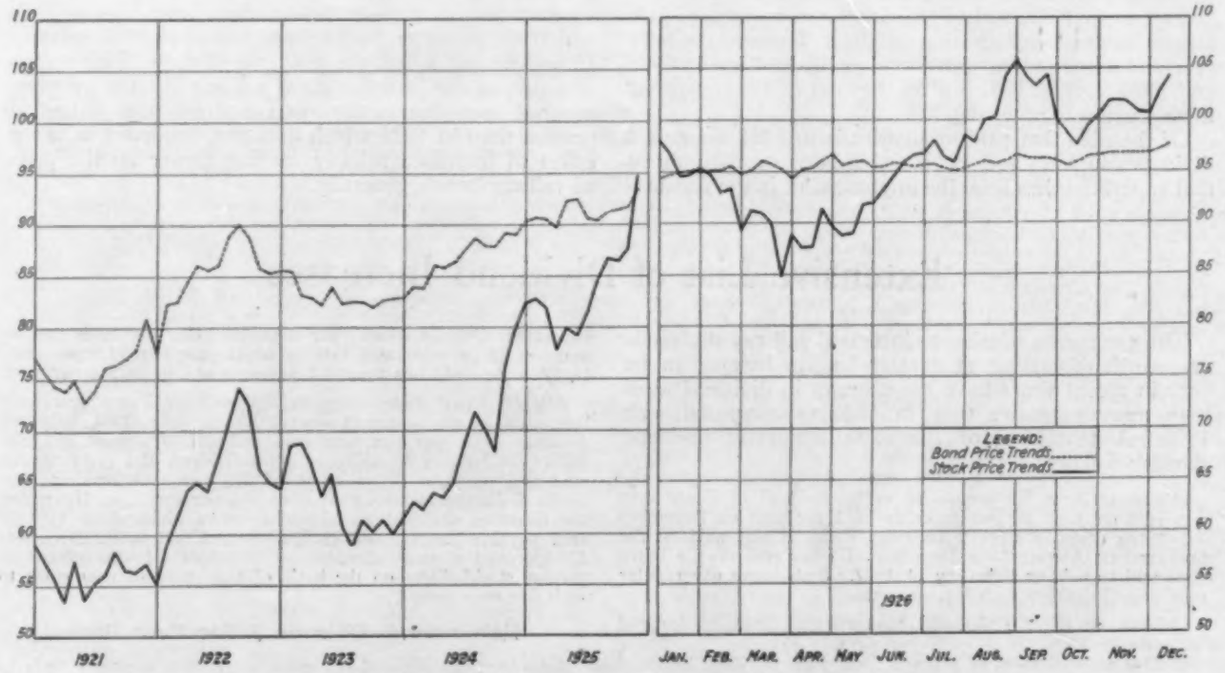
Security price averages improve; many dividend increases; fewer roads in receivership; less new financing; competitive bidding for equipment trusts

By Charles W. Foss
Financial Editor, *Railway Age*

AS 1926 comes to a close the railway financial situation, taken as a whole, is in much the best shape that it has been in for many years. This is reflected in the view expressed in many quarters that railway stocks and bonds are rapidly becoming about the most desirable securities available for the conservative investor. At the same time, there is also considerable interest in both railway stocks and bonds from the speculative side due to the improving values with improving earnings, or prospects thereof, or to the effect on values of merger possibilities. The most pleasing aspect is the decided contrast between the status of affairs now and that of a few years ago, when railway securities, except, of course, those of the strongest properties, were rather avoided in favor of industrials or public utilities. Investors felt that their money was safer when invested in industries where conditions were less uncertain, and railway conditions were so adverse as to make railway stocks or the lower grade railway bonds unattractive to the speculative element which preferred to have a fairer chance for ready profit and a more rapid turnover.

It is not necessary to discuss the many pleasing factors of the railway situation that have helped to make railway securities more attractive, since these factors are described and discussed in other articles of this issue. Presumably the most important of these factors are the improved earnings of the carriers and their ability to show a wider margin of earnings over interest requirements or to increase their rates of dividend payments. Another important factor is consolidations which have helped to give the securities of properties involved in contemplated mergers a special attraction in the stock market. A third factor is the general improvement of the attitude towards the railroads resulting from the understanding that the carriers are now operating with greater efficiency and rendering better service than in any previous period in their history. The improved relations with the public and the employees also have been of great effect because, in spite of all that may be said to the contrary, these are matters that are given great weight in the financial markets, particularly in an industry where the influences of politics or of labor difficulties and employee morale bulk so large in importance as in the industry of railway transportation.

The *Railway Age* reports in its financial news column each week average prices of railway stocks and bonds. It has been compiling these averages since January, 1921. The figures are the average price of 20 leading railway common stocks and 20 representative railway bonds. These average prices are plotted in the curves by months for the years 1921 to 1925 and by weeks for 1926. The curves form an eloquent story of the improvement in the financial position of the railways in this six-year period. Briefly the important aspect is that in 1921 the average



Average Prices of 20 Leading Railway Stocks and 20 Representative Railway Bonds, 1921 to 1926

price of the 20 railway stocks ranged between 50 and 60 while in 1926 it has ranged between 85 and 105, and now stands at above par, which means that from the beginning of the period to the present the average price of these leading railway stocks has nearly doubled. In the case of the bonds the average has risen from the 70's in 1921 to around 97 at present, an increase entirely too great to be explained alone by the vagaries of stock exchange price fluctuation.

Average Price of 20 Stocks Increases

It is interesting to observe particularly how railway stocks have been made more attractive to investors by the increased railway earnings and by the manner in which these increased earnings have been passed on to the investor by increased divideds. The following table lists the 20 stocks and indicates the dividends paid on each in 1921, when the *Railway Age* averages were started, in 1925 and in 1926:

Table I—Dividends Paid in 1921, 1925 and 1926, on 20 Leading Railway Stocks

	1921	1925	1926
Atchison, Topeka & Santa Fe	6	7	7
Atlantic Coast Line	7	8	*9½
Baltimore & Ohio	0	5	5¼
Chesapeake & Ohio	0	4	12
Chicago & North Western	5	4	4
Chicago, Milwaukee & St. Paul	0	0	0
Chicago, Rock Island & Pacific	0	0	0
Erie	0	0	0
Great Northern	7	5	5
Illinois Central	7	7	7
Missouri Pacific	0	0	0
New York Central	5	7	7
New York, New Haven & Hartford	0	0	0
Norfolk & Western	7	8	10
Northern Pacific	7	5	5
Pennsylvania	4½	6	6¼
St. Louis-San Francisco	0	5½	7
Southern Pacific	6	6	6
Southern Railway	0	5	7
Union Pacific	10	10	10

*Does not include extra dividend of 1½ per cent to be paid January 10.

It will be observed that, of the 20 issues, 11 paid dividends in 1921 and nine did not. Of the 11 that paid dividends in 1921 five paid greater dividends in 1925 and 1926 than in 1921, and of these five three, further, paid larger dividends in 1926 than in 1925. Three of the 1921 dividend payers, all northwestern roads, paid less in 1925 and 1926 than in 1921 and in the case of the remaining three there was no change.

Of the nine that paid no dividends in 1921, four paid dividends in 1925 and 1926, and it is of special interest that so striking has been the improvement in the fortunes of these four carriers that all four increased their dividend rates in 1926 as compared with 1925.

Five paid no dividends in 1921, 1925 or in 1926, but all five are now reporting a much improved earnings position with the result that the market price has taken cognizance of improved earning power and possible dividend equities for the future. The St. Paul, of course, has a peculiar position of its own in the picture because of its receivership and pending reorganization.

Financing with Stock

It is noteworthy that the 20 stocks are of sufficient variety to represent the true average position of railway stocks as a whole. This improved situation naturally suggests the possibilities of railway financing with stock issues. This is discussed in somewhat more detail below, but it will be noted that, of the 20 issues in the list, two are of carriers that are about to issue additional stock, namely, the Atlantic Coast Line and the Southern Railway. In the first case the amount is $13,756,580. In the case of the Southern the amount is $10,000,000 to be issued shortly of a total authorized increase of $30,000,000.

Bond Prices Improve

It has been noted that the average price of the 20 representative bonds has increased from between 70 and 80 in 1921 to approximately 95 in 1926. The 20 bonds selected are similarly of a wide variety. The increase in the average has been due principally to the low grade issues. An example is the New Haven non-convertible debenture 4's maturing in 1956 which sold during most of 1921 at about 40, but which today are quoted at about 78. The Missouri Pacific general 4's maturing in 1975 have similarly come up in price from about 52 or 53 in 1921 to a present 77, while the Southern general 4's of 1956 have had an accretion in value from around 58 to 86. All three of these roads have reported substantial improvement in their earning power in this period. The more general improvement of money conditions has, of course, also had an effect which should not be passed over. This is reflected notably in such high grade standard issues as the Atchison, Topeka & Santa Fe general 4's maturing in 1956 or the Atlantic Coast Line first 4's with 1952 maturity, both of which sold in 1921 between 75 and 80, but which are now quoted at 94. This means that part of the increase in the railway bond price average has been due to the lower interest rates ruling at present than in 1921 which does not, however, belie the effect of increased railway earning power on the price of railway bonds generally.

Extensive List of Dividend Increases

The comments relative to increased railway dividends are worth discussing at greater length, because in no year in recent years have the changes in dividend rates been more extensive than in 1926 as compared with 1925. A tabulation of the more important dividend changes follows:

Alabama Great Southern.—An extra dividend of 5 per cent was paid on June 28 and an extra of 1 per cent on December 30 on the common stock. An extra dividend was paid on the preferred on August 14 and another of 1 per cent on the latter issue will be paid on February 14, 1927. Both issues pay regular semi-annual dividends of 3½ per cent.

Atlanta & West Point.—In January the directors declared an extra dividend of 20 per cent payable February 1. There was also a dividend of 4 per cent paid July 1. This company has maintained a 6 per cent dividend rate from 1884 to 1923, except for 1900 in which year it paid regular dividends and an extra of 25 per cent, and 1915 in which year it paid 9 per cent. In 1924 the dividends totaled 7 per cent and in 1925 8 per cent.

Atlantic Coast Line.—Regular dividends of 7 per cent have been paid by this company since 1917. In July, 1924, an extra dividend of 1 per cent was paid and a like amount in July, 1925. On January 10, 1926, an extra dividend of 1 per cent was paid and on July 10 an extra of 1½ per cent making total dividend disbursements for 1926 of 9½ per cent. In November the directors declared an additional extra dividend of 1¼ per cent payable January 10, 1927, and stockholders on December 13 approved a stock dividend of $13,756,000 to be offered to present stockholders on the basis of one share of new stock to each five now owned.

Baltimore & Ohio on 7 Per Cent Basis

Baltimore & Ohio.—On September 7, the directors declared a quarterly dividend on the common stock of 1¼ per cent pay-

able December 1, thereby placing the common stock on a 6 per cent annual basis. This restored the 6 per cent rate paid by the company from September, 1906, to March, 1914. The rate was reduced to 5 per cent in September, 1914, and was continued at that rate until March, 1918. Two per cent was declared in February, 1919, then none to December 1, 1923, when dividends were resumed at the 5 per cent rate. On December 15, an extra dividend of 50 cents was declared payable March 1.

Boston & Maine.—The reorganization plan was declared operative on July 27 and the board of directors declared dividends on the first preferred stock payable August 12 as follows: Class A, $2.50; B, $4.00; C, $3.50; D, $5.00 and E, $2.25. On December 14 additional dividends on this issue were declared, payable January 1 as follows: Class A, $5.00; B, $8.00; C, $7.00; D, $10.00 and E, $4.50, the payments being applied from earnings in the last half of 1926 and the last half of 1925. The 1926 payments were the first paid on the first preferred stock since 1920, prior to which there had been no dividends since 1913. On January 1, a dividend of $2.33 will be paid on the new prior preference stock issued in connection with the reorganization plan covering the four months' period since this stock was issued on September 1, 1926.

Buffalo & Susquehanna.—Directors on February 26 voted to omit the quarterly dividend on the common stock. In 1923 the company paid 17 per cent and in 1924, 9½ per cent, both including extras. It maintained the regular rate of 1¾ per cent for the first three-quarters of 1925 but in the last quarter reduced the payment to ¾ per cent.

Chesapeake & Ohio Payments Total 12 Per Cent

Chesapeake & Ohio.—The regular rate on the common stock was 2 per cent semi-annually from December, 1916, to December, 1920, dividends being paid on June 30 and December 31. No dividends were paid in 1921 but in 1922 the 4 per cent annual rate was resumed with semi-annual dividends payable on January 1 and July 1. In 1926 the January 1 dividend was paid on the former basis but in March the directors voted to change the annual rate to 8 per cent and in addition declared a special dividend of 4 per cent payable April 15. This means that the 1926 payments have totaled 12 per cent.

Chicago, Indianapolis & Louisville.—This company, which is controlled jointly by the Southern and the Louisville & Nashville reflected the prosperity of its two proprietary companies by having earnings in 1926 sufficient to permit it to pay an extra dividend of 1 per cent on its common stock on July 10 and another extra of the same amount becomes payable on January 1, 1927. The regular dividends are at the rate of 5 per cent annually, which rate dates back to January, 1925.

Cincinnati, New Orleans & Texas Pacific.—A 200 per cent common stock dividend was paid on April 29, increasing the common stock from $3,000,000 to $9,000,000. From 1922 to 1925 the company had been paying 6 per cent regular and 7 per cent extra dividends annually on its common stock. On June 25, 1926, a dividend of 4 per cent was paid on the increased capitalization, establishing a new annual rate of 8 per cent, equivalent to 24 per cent on the former capitalization. In addition, an extra dividend of 3 per cent was paid on December 21.

Colorado & Southern.—Directors on December 1 declared a dividend of 3 per cent on the common stock payable December 31, the first dividend on this issue since 1922 when 3 per cent was paid.

Gulf, Mobile & Northern.—On January 3 preferred stockholders will receive a dividend of 4 per cent, of which 2½ per cent will be applied on accumulations and 1½ per cent will be regular quarterly dividend. As of January 1, 1927, accumulated dividends on this issue total 17½ per cent.

Hocking Valley.—This subsidiary of the Chesapeake & Ohio had been paying 2 per cent semi-annual dividends from December, 1921, to December, 1925. In March, 1926, the directors increased the rate to 8 per cent annually payable in quarterly installments and also declared a special dividend of 4 per cent payable April 30.

Lake Erie & Eastern.—An initial dividend of 2 per cent on this company's $6,903,000 stock, all owned by the New York Central, was paid on July 1.

Lehigh Valley.—On January 3 common stockholders will receive an extra dividend of 3 per cent in addition to the regular quarterly dividend of 1¾ per cent. The regular dividends on the common stock have been 7 per cent annually since 1920 prior to which for a number of years they were 10 per cent.

Louisville & Nashville.—Stockholders received an extra dividend of ½ per cent on August 10 in addition to the regular semi-annual dividends of 3 per cent. On February 10, they will receive a 3½ per cent semi-annual dividend which will put the stock on a 7 per cent annual basis for 1927. With the extra of ½ per cent paid in August the payments in 1926 totaled 6½ per cent. The Louisville & Nashville paid 7 per cent dividends from 1910 to 1914. The dividend rate was decreased to 5 per cent in February, 1915, and restored to the 7 per cent basis in August, 1916, and continued at that rate until 1923. In May of that year a 62½ per cent stock dividend was paid and the dividend on the increased capitalization made 5 per cent, equivalent to 8⅓ per cent on the former amount of stock. The rate was increased to 6 per cent in August, 1924 which rate has since been maintained.

Maine Central.—This company in June resumed dividends on its common stock by declaring a special payment of $1.00 a share payable June 15 which was the first dividend paid on this issue since October 1, 1920, prior to which the regular rate was 6 per cent annually. Accumulations on the 5 per cent preferred dividends were cleared up by payments of $7.50 on January 15 and of the same amount on March 1. Another 1 per cent on the common stock was paid on December 15.

Michigan Central Now on 35 Per Cent Annual Basis

Michigan Central.—On July 29 a dividend of 17½ per cent was paid. Inasmuch as on January 29, 1926, the regular semi-annual dividend of 10 per cent was paid and an extra of 7½ per cent the 1926 dividend disbursements will total 35 per cent. Semi-annual dividends of 10 per cent had been paid since July, 1923. The new annual rate of 35 per cent is being continued with the 17½ per cent semi-annual dividend payable January 29, 1927.

Missouri-Kansas-Texas.—The preferred stock series A was put on a 6 per cent annual basis by the payment of a quarterly dividend of 1½ per cent on May 1. From February 2, 1925, to February 1, 1926, the company paid quarterly dividends of 1¼ per cent. The annual dividends on this stock are to be 7 per cent cumulative after January 1, 1928.

New York, Chicago & St. Louis.—Directors in March declared an extra dividend of 1½ per cent on the common stock payable April 15 in addition to the regular quarterly dividend of 1½ per cent.

Norfolk & Western.—On December 18 common stockholders received an extra dividend of $3.00 in addition to the regular quarterly dividend of $1.75. The 7 per cent rate dates back to 1916, prior to which, back to 1911, it was 6 per cent. Extra dividends of 1 per cent were paid in 1916, 1917, and from 1922 to 1925.

Pennsylvania Rate 7 Per Cent

Pennsylvania.—On October 27, the directors declared a quarterly dividend of 1¾ per cent on the $50 par value stock payable November 30, and thereby put the stock on a 7 per cent basis. The rate formerly had been 6 per cent, maintained since 1900 except in 1906 when 6½ per cent was paid and in 1907 when 7 per cent was paid and in 1921 and 1922 when the rate was reduced to 4 per cent.

Pittsburgh & Lake Erie.—An extra dividend of $5 (10 per cent) will be paid on February 1, in addition to the regular semi-annual dividend of $2.50 (5 per cent). This company, the majority of the stock of which is owned by the New York Central, has paid not less than 10 per cent in every year since 1892.

Reading.—Common stockholders will receive on February 10 an extra dividend of 2 per cent in addition to the regular quarterly dividend of 2 per cent. The Reading Company has been paying 8 per cent dividends on its common stock since 1913.

Rutland.—Directors on December 14 declared a dividend of $1.00, on the preferred stock, the first dividend since 1918. Dividends on this issue are 7 per cent cumulative but were discontinued in 1903. In 1906, 1907 and 1908 1½ per cent was paid and in 1916, 1917 and 1918 2 per cent. Arrears on the issue at present total 301 per cent.

Virginian.—A dividend of 7 per cent on the common stock was paid December 31. An initial dividend on this issue of 4 per cent was paid in 1923; 4 per cent in 1924 and 6 per cent in 1925.

West Jersey & Seashore.—In March, the directors declared a semi-annual dividend of 3 per cent, payable April 1. In 1925 two semi-annual payments of 2½ per cent were made. In September, 1926, the former semi-annual dividend rate of 2½ per cent was restored, making 1926 disbursements total 5½ per cent as compared with 5 per cent in 1925.

New Financing

Borrowing by the steam railroads in the United States totaled $446,013,200 in 1926 and while a huge amount in itself, this figure represented only about 7.5 per cent of the total financing of the year. Other public utilities, particularly the power and light industries, were the greatest borrowers since their needs for construction and expansion were much greater than the requirements of the railroads during the past 12 months.

Considering that the expenditures for additions and betterments in 1925 totaled 754 million dollars and in 1926 about 875 million, it would appear that the railways are paying for a strikingly large proportion of their increased investment in fixed property and equipment from surplus rather than from new capital. This may explain why it is that in spite of the large capital expenditures in 1926 the total volume of financing done in 1926 was less than in several preceding years and why it constituted a decreased proportion of all new financing.

ized common stock in the amount of $100,000,000 which plan was approved by the stockholders of the Company in October.

The railroads in this country were originally financed largely by the sale of bonds with common stock often included as a bonus and it could readily be seen that some time must elapse before railroad stocks could reach an earnings position where they would be classed as good investments. Rail stocks were among the first junior securities to be dealt in on the various stock exchanges in any volume and for a long period they led in speculative interest. In more recent years the effects of efficient and conservative management and steady plowing back of earnings into the properties are beginning to reflect their real investment worth.

Securities Sold in 1926

A glance at railway borrowing figures during the past seven years is made possible in the following tabulation:

Table II—Railway Securities Sold to Public in 1916 and 1920 to 1926

	Bonds	Notes	Stock	Total R.R. financing	Total all financing	Per cent R.R. to total
1916	$229,000,000	$126,000,000	$16,000,000	$371,000,000	$1,864,000,000	19.90
1920	194,583,000	193,840,000	3,737,000	392,160,000	3,324,922,000	12.12
1921	455,125,000	202,928,300	27,222,500	685,275,800	2,780,874,000	24.64
1922	299,025,800	288,936,500	27,068,100	615,030,400	3,200,176,000	19.22
1923	165,956,000	354,720,500	59,140,850	579,817,350	3,602,704,000	16.04
1924	620,347,000	351,276,200	11,000,000	982,623,200	4,185,590,000	23.46
1925	374,020,500	151,753,740	30,934,430	556,708,670	5,234,992,000	10.63
*1926	236,954,000	167,482,000	41,577,200	446,013,200	5,616,151,985	7.50

* To December 26.

It may mean that the increase in investments will result in heavy financing in the next year or two to fund the heavy capital expenditures that have been made, but against which new securities have not yet been issued. It now begins to seem likely that with the increased prosperity of the carriers a larger part of such new securities can be in the form of common stock so that the carriers will not have to depend on the sale of bonds to the same extent as in the past.

As pointed out by John J. Cornwell, general counsel of the Baltimore & Ohio, speaking before the Traffic and Transportation Association of Pittsburgh a month or so ago, to prevent the capital structure of the railroads from becoming topheavy, it will be necessary for the majority of them to finance additional expenditures by sale of stock. It follows that in order to make their respective stocks attractive as investments the roads must be allowed to earn a fair return on their properties, and it has already been noted in this article that the roads have shown an increasing ability to do this in the recent past and have every prospect of continuing to do so.

Stock

Financing by means of common stock has shown some gain in the past ten-year period. Only $16,000,000 of common stock was offered in 1916, but in 1923 this figure rose to $59,140,000. The latter amount was mainly represented by the New York Central stock offering of some $34,000,000. In 1926 common stock offered totaled only $41,577,200, but four large systems participated; the Southern Railway is offering $10,000,000 common, the Atlantic Coast Line $13,756,580; the St. Louis-San Francisco sold $5,000,000 and the Nickel Plate $6,843,789. In the first two cases the stock is being offered direct to the stockholders. The Frisco's stock was taken from its treasury and sold to bankers to finance the purchase of Rock Island common stock. That the trend is in this direction is shown also by the proposals of the New York Central to increase its author-

In the table, it appears that 1921 and 1924 stand out as the years of heavier financing, but that 1926 was considerably below the years immediately preceding. In 1921 the roads were just beginning to recover from the effects of Federal control. The borrowing in 1921 of $685,275,000, comparing with only $392,160,000 in 1920, represented largely financing in connection with reimbursements for capital expenditures made during federal control and it included also the refinancing in connection with maturing obligations of the Great Northern and Northern Pacific covering their joint interest in the Burlington.

It must be kept in mind that rates in 1920 and 1921 ranged between 6½ and 7½ per cent, even for best commercial paper and for corporations with the finest credit ratings. Financing continued at about the same rate in 1922 and 1923 with money rates but slightly lower, equipment financing in 1923 being particularly important. However, in 1924 there was an increase in railroad borrowing to $982,623,000, about two-thirds greater than that of the previous year. The sudden jump is explained by the generally easier money conditions which then prevailed and by the demands of the railroad rehabilitation program then under way. Industrial corporations which also had been hard hit in the post war depression had put their respective houses in order and inventories had been reduced, bringing about a generally easier credit situation. The railroads were quick to take advantage of this condition and hastened to refund their high coupon issues with securities carrying lower interest rates as well as to finance the large purchases of new equipment and other capital improvement.

Bond offerings in 1926, totaling $236,954,000, were mainly for refunding purposes. They were less than in 1925 and much below 1924, while offerings of notes inclusive of equipment obligations were about the same as in 1925 and but one-half of those of 1924.

Table III—Railroad Securities Issued in 1926

(Excludes Equipment Trust Issues Which Are Shown Separately in Table X.)

Name of road		Amount	Rate	Price	Yield	Maturity date	Issued by
January			*Bonds*				
Baltimore & Ohio Ref. & Gen. Mtge.	Series D	$30,000,000	5	95½	5.24	2000	Kuhn, Loeb & Co., Speyer & Co., National City Co.
Maine Central Ref. Mtge.	Series D	4,000,000	6	...	...	....	
N. Y. Connecting First Mtge.	Series B	3,500,000	5	99½	...	1953	J. P. Morgan & Co. and Kuhn, Loeb & Co.
Tennessee Central Co. First Mtge.	Series A	3,000,000	6	100	6.00	1947	White, Weld & Co., American National Co., Nashville
Akron, Canton & Youngstown	Series B	800,000	5½	94	...	1945	Faxon, Gade & Co., Inc., Boston, and Stroud & Co., Philadelphia
February			*Bonds*				
Delaware & Hudson Co. First & Ref. Mtge.	.....	2,196,000	4	92	4.68	1943	Kuhn, Loeb & Co., First National Bank
March			*Bonds*				
Texarkana & Fort Smith First Gtd. Mtge.	Series A	10,000,000	5½	100½	5.46	1950	Ladenburg, Thalman & Co., National City Co.
Florida East Coast First & Ref. Mtge.	Series A	15,000,000	5	98	5.10	1974	J. P. Morgan & Co., First National Bank, National City Co.
Central of Georgia Ref. & Gen. Mtge.	Series C	3,000,000	5	97	5.19	1959	Kuhn, Loeb & Co.
			Notes				
St. Louis-San Francisco 2 yr. notes	.....	5,000,000	5	100	5.00	1928	Speyer & Co.
April			*Bonds*				
Chicago & North Western Gen. Mtge.	.....	18,632,000	4¾	102½	4.63	1987	Kuhn, Loeb & Co., National City Co.
Southern Ry. Consolidated Mtge.	.....	1,774,000	5	...	...	....	
			Notes				
Chicago, Rock Island & Pacific secured notes	.....	6,000,000	4½	99.32	4.86	1928	Speyer & Co., Dillon, Read & Co.
Canadian National 1 yr. notes	.....	2,500,000	4	99.55	4.40	1927	R. W. Pressprich & Co.
May			*Bonds*				
Norfolk & Western Div. First Lien & Gen. Mtge.	.....	6,000,000	4	93¾	4½	1944	Guaranty Co.
			Notes				
International Railways of Central America	.....	3,500,000	6	96	6.40	1941	J. Henry Schroder Banking Corp. and Blyth, Witter & Co.
June			*Bonds*				
Great Northern Gen. Mtge.	Series D	15,000,000	4½	94	4.80	1976	J. P. Morgan & Co., First National Bank, National City Co.
International-Great Northern First Mtge.	Series B	6,000,000	5	95	5.33	1956	Kuhn, Loeb & Co.
Cuba R. R. Ref. Mtge.	Series B	1,376,000	6	...	...	....	
Chicago, Ind. & Louisville First & Gen.	Series A	1,000,000	5	98	5.13	1966	Potter & Co., Harris, Forbes & Co.
Kansas, Oklahoma & Gulf First Mtge.	.....	1,000,000	6	96	6.25	1976	Ed. B. Smith & Co., W. H. Newbold's Son & Co.
July			*Bonds*				
Wabash Ref. & Gen. Mtge.	Series B	15,500,000	5	95½	5.25	1976	Kuhn, Loeb & Co.
Seaboard Air Line First & Cons.	Series A	8,000,000	6	95½	6.40	1945	Dillon, Read & Co., Ladenburg, Thalmann & Co., Kissell, Kinnicutt & Co.
New Orleans, Texas & Mexico First Mtge.	Series C	4,600,000	5	100	5.00	1956	Kuhn, Loeb & Co.
Wheeling & Lake Erie Ref. Mtge.	.....	2,000,000	5	99.15	5.05	1966	Otis & Co.
			Stock				
St. Louis San Francisco Common	.....	5,000,000	7 Div.	...	...	....	Bought by bankers to finance Rock Island purchase
August			*None*				
September			*Bonds*				
Illinois Central	.....	35,000,000	4¾	96½	4.95	1966	Kuhn, Loeb & Co.
Canadian Pacific collateral trust	.....	20,000,000	4½	96½	4.77	1946	National City Co., Guaranty Co., Bank of Montreal
October			*Bonds*				
Missouri Pacific	.....	13,156,000	5¼	99¾-99¼	5.30	5.30 Serial	Kuhn, Loeb & Co.
Wheeling & Lake Erie Ref. Mtge.	Series B	2,000,000	5	99.15	5.05	1956	Otis & Co.
Georgia & Florida Income	.....	1,500,000	6	...	...	....	Issued to former bondholders under reorganization program
			Stock				
Southern Railway, Common	.....	10,000,000	..	...	...	....	Offered to common holders in ratio of 1 share to every 18 held
Detroit & Ironton, Common	.....	2,972,000	..	...	...	....	
November			*Bonds*				
Georgia & Florida	.....	3,800,000	6	...	...	....	Sold to bankers
			Stock				
Atlantic Coast Line, Common	.....	13,756,580	..	...	...	....	Offered to common shareholders in ratio of 1 share to every 5 held
December			*Notes*				
Wisconsin Central, secured notes	.....	7,500,000	5	99	5.35	3-1930	Dillon, Read & Co., Nat'l City Co.
			Stocks				
New York, Chicago & St. Louis, Preferred	.....	6,848,500	6	103½	...	....	Guaranty Co. and Lee, Higginson & Co.

Railroads in the Hands of Receivers

On December 31, 1926, there were in the hands of receivers but 42 railroad properties operating a total of 17,711 miles of line. The number of roads was six less than at the end of 1925 and the smallest number since 1911. The mileage operated was less than at the end of 1925, but on account of the inclusion of the Chicago, Milwaukee & St. Paul it was larger than for any year since 1918 with the single exception of 1925.

During 1926 only two companies were placed in the hands of receivers and only one of these was an operat-

Table IV—Receiverships Established in 1926

Name of road	Mileage	Funded debt outstanding	Capital stock outstanding
Southern New England	.....	.....	.....
Winchester & Western	40	.....	.....
Two companies	40	.....	.....

Table V—Railroads in the Hands of Receivers on December 31, 1926

Road	Mileage operated	Mileage owned	Date of receivership	Long term debt outstanding	Capital stock outstanding	Total old company securities*	Remarks
Alabama, Florida & Gulf	32	32	June 3, 1924	None	$50,000	$50,000	
Atlanta, Birmi'gh'm & Atlantic	640	637	Feb. 25, 1921	$9,793,907	30,000,000	39,966,407	Sold on June 22, 1926, to be reorganized as Atlanta, Birmingham & Coast
Atlantic & Yadkin	163	163	Mar. 24, 1924	1,500,000	1,000,000	2,500,000	
Birmingham, Columbus & St. Andrews	38	19	Dec. 24, 1908	250,000	None	275,916	
California & Oregon Coast	15	15	Feb. 18, 1925	None	350,000	390,000	
Cape Girardeau Northern	12	104	Apr. 14, 1914	1,500,000	110,000	1,783,400	May be sold in sections
Chicago & Alton	1,056	691	Aug. 30, 1922	84,184,000	39,955,500	130,329,400	
Chicago, Milwaukee & St. Paul	11,205	10,252	Mar. 18, 1925	306,159,600	233,379,384	634,211,984	Sold on Nov. 22 to representatives of reorganization managers
Dansville & Mount Morris	18	16	June 8, 1894	150,000	50,000	206,901	
Delaware & Northern	40	40	Mar. 16, 1921	None	1,250,000	1,270,000	
Denver & Salt Lake	255	252	Aug. 16, 1917	11,802,149	583,515	12,385,664	Sold Aug. 17, 1926. Reorganization plan approved by I. C. C.
Eastern Kentucky	36	36	Mar. 31,1919	None	3,455,900	3,455,900	
Ettrick & Northern	10	10	June 28, 1922	54,300	144,000	205,950	
Frankfort & Cincinnati	41	40	Nov. 1, 1925	None	40,000	41,500	Sale ordered.
Gainesville & Northwestern	37	35	Dec. 8, 1923	75,000	750,000	850,000	
Gainesville & Midland	74	72	Feb. 15,1921	973,011	550,000	1,523,011	To be acquired by Seaboard Air Line.
Georgia & Florida	445	442	Mar. 27, 1915	8,216,000	8,695,000	18,903,000	Reorganization completed.
Gulf, Texas & Western	130	99	Jan. 24, 1921	2,000,000	500,000	2,500,000	
Kansas & Oklahoma	19	19	Apr. 17, 1923	None	288,900	288,900	
Manistee & North-Eastern	114	90	Dec. 24, 1918	852,000	2,000,000	2,852,000	
Minneapolis & St. Louis	1,627	1,513	July 26, 1923	41,359,051	25,792,600	72,247,151	
Nevada Copper Belt	41	41	Apr. 2, 1925	622,000	1,000,000	1,622,000	
North & South	41	41	Aug. 1, 1924	None	None	2,849	
Ohio & Kentucky	40	40	Dec. 2, 1925	442,500	300,000	742,500	
Oklahoma & Arkansas	20	20	Aug. 15, 1924	.....	307,500	307,500	Authorized to abandon line.
Paris & Mt. Pleasant	51	51	Feb. 26, 1920	600,000	75,000	855,000	
Peoria Railway Terminal	9	8	Aug. 3, 1922	2,444,000	1,000,000	3,444,000	To be reorganized as Peoria Terminal, in interest of C. R. I. & P.
Pine Bluff & Northern	8	8	Feb. 9, 1916	None	160,000	160,000	
Pittsburg, Shawmut & Nor.	210	190	Aug. 1, 1905	14,655,600	15,000,000	31,459,500	
Rio Grande	26	26	Nov. 1925	280,400	25,000	305,400	Sold to new interests.
St. Louis, El Reno & Western	42	42	Oct. 9, 1915	817,000	970,800	1,787,800	
Sandy River & Rangeley Lakes	97	97	July 8,1923	837,000	340,000	1,177,000	
San Luis Southern	32	32	Feb. 29, 1924	327,000	1,000,000	1,365,208	
Saratoga & Encampment	44	44	Dec. 8, 1924	.....	.....	.....	
Savannah & Atlanta	145	145	Mar. 4, 1921	3,372,000	2,250,000	5,772,000	
Sharpsville Railroad	21	21	Jan. 21, 1897	None	350,000	350,000	
Tallulah Falls Railway	57	57	June 24,1923	1,519,000	323,400	1,842,400	
Toledo, Peoria & Western	248	231	July 2, 1917	4,895,000	4,076,900	8,971,900	Sold on June 11, 1926.
Trinity & Brazos Valley	367	303	June 16, 1914	8,760,000	304,000	9,961,014	
Wabash, Chester & Western	65	65	Jan. 4, 1924	690,000	1,250,000	1,970,862	
Wichita Northwestern	100	100	Nov. 10, 1922	381,750	1,690,000	2,121,750	
Winchester & Western	40	40	June 21, 1926	.....	.....	.....	

*Includes receiver's certificates, equipment trust certificates, etc.

Table VI—Foreclosure Sales in 1926

Name of road	Mileage	Funded debt outstanding	Capital stock outstanding	Remarks
Alaska Anthracite	22	.....	$643,842	Sale October 9 to bondholders
Atlanta, Birmingham & Atlantic	640	$9,793,907	30,000,000	To be reorganized as Atlanta, Birmingham & Coast, a subsidiary of the Atlantic Coast Line
Chicago, Milwaukee & St. Paul	11,007	306,159,600	233,379,384	Sold on November 22 to representatives of reorganization managers. To be reorganized as Chicago, Milwaukee, St. Paul & Pacific
Denver & Salt Lake	255	11,802,149	583,515	Sold August 17 to reorganization committee. New plan submitted to I. C. C.
Gainesville Midland	74	973,011	550,000	Part of line, 44 miles, to be acquired by Seaboard Air Line
Georgia & Florida	445	8,216,000	8,695,000	Reorganization completed
Knoxville & Carolina	30	187,500	260,200	Sold on October 18 to officers of the Tennessee & North Carolina
Peoria Railway Terminal	9	2,444,000	1,000,000	Sold January 6, to be reorganized as Peoria Terminal Co.
St. Louis, El Reno & Western	42	317,000	970,800	
Tampa & Jacksonville	56	520,000	604,900	Sold August 2 to committee of bondholders
Toledo, Peoria & Western	248	4,895,000	4,076,900	
Wellington & Powellsville	24	.....	90,000	
Twelve companies	12,852	$345,808,167	$280,854,541	

ing company, the other being the Southern New England which never completed its ambitious project of giving the old Grand Trunk an entrance into Providence, R. I., and which was placed in the hands of receivers to assist in closing out the company's affairs. The number of roads placed in the hands of receivers was the smallest ever reported for a similar period since the records began to be kept in 1876. The next best year was 1901 with four roads.

The list of roads in receivership at the end of the year shows no particularly substantial changes from the list as of December 31 a year ago, with the exception of the elimination of the Kansas, Oklahoma & Gulf, 314 miles, reorganized without foreclosure and the Wichita Falls, Ranger & Fort Worth, 75 miles, which has been acquired by the Missouri-Kansas-Texas. However, there will be an unusually large number of roads and an unusually large mileage which will be taken out of the hands of receivers during the forthcoming year. This will be due to the large number of pending reorganizations of roads sold at foreclosure in 1926, but not taken over by their new organizations in time to be removed from the list of roads operated by receivers on December 31, 1926.

The number of roads sold at foreclosure in 1926 totaled 12 with a mileage of 12,852. This compares with six roads with a mileage of 638 in 1925, or with 14 with a mileage of 3,992 in 1924. The number of roads sold at court sales does not break any records, but the fact that one of the properties was the Chicago, Milwaukee & St. Paul with over 11,000 miles of line makes the mileage of roads sold at auction in 1926 the largest with only one exception—1896—since the records began in 1876. Besides the St. Paul, there was the Atlanta, Birmingham & Atlantic, the Denver & Salt Lake, the Georgia & Florida, the Toledo, Peoria & Western, all reorganized.

Table VII—Railroad Mileage in the Hands of Receivers

(Figures to 1924, Inclusive, from I. C. C. Statistics for Year Ended December 31, 1924. Figures for 1925 and 1926 Compiled by *Railway Age*)

Year end	Miles of road operated by receivers at close of year	Net change during the year in miles of road operated	Number of roads in charge of receivers at close of year
June 30, 1894	40,819	.....	192
1895	37,856	—2,963	169
1896	30,476	—7,380	151
1897	18,862	—11,614	128
1898	12,745	—6,117	94
1899	9,853	—2,892	71
1900	4,178	—5,675	52
1901	2,497	—1,681	45
1902	1,475	—1,022	27
1903	1,185	—290	27
1904	1,323	+138	28
1905	796	—527	26
1906	3,971	+3,175	34
1907	3,926	—45	29
1908	9,529	+5,603	52
1909	10,530	+1,001	44
1910	5,257	—5,273	39
1911	4,593	—664	39
1912	9,786	+5,193	44
1913	16,286	+6,500	49
1914	18,608	+2,322	68
1915	30,223	+11,615	85
1916	37,535	+7,130	94
Dec. 31, 1916	34,804	—*2,550	80
1917	17,376	—17,428	82
1918	19,208	+1,832	74
1919	16,590	—2,618	65
1920	16,290	—300	61
1921	13,512	—2,778	68
1922	15,259	+1,747	64
1923	12,623	—2,310	64
1924	8,105	—4,518	61
1925	18,039	+10,134	48
1926	17,711	—328	42

* Represents decrease for six months.

Table VIII—Roads Placed in Receivership, 1876 to 1926

Year	Number of roads	Miles	Bonds and stocks
1876	42	6,662	$467,000,000
1877	38	3,637	220,294,000
1878	27	2,320	92,385,000
1879	12	1,102	39,367,000
1880	13	885	140,265,000
1881	5	110	3,742,000
1882	12	912	39,074,000
1883	11	1,990	108,470,000
1884	37	11,038	714,755,000
1885	44	8,836	385,460,000
1886	13	1,799	70,346,000
1887	9	1,046	90,318,000
1888	22	3,270	186,814,000
1889	22	3,803	99,664,000
1890	26	2,963	105,007,000
1891	26	2,159	84,479,000
1892	36	10,508	357,692,000
1893	74	29,340	1,781,046,000
1894	38	7,025	395,791,000
1895	31	4,089	369,075,000
1896	34	5,441	275,597,000
1897	18	1,537	92,909,000
1898	18	2,069	138,701,000
1899	10	1,019	52,285,000
1900	16	1,165	78,234,000
1901	4	73	1,627,000
1902	5	278	5,835,000
1903	9	229	18,823,000
1904	8	744	36,069,000
1905	10	3,593	176,321,000
1906	6	204	55,042,000
1907	7	317	13,585,000
1908	24	8,009	596,359,000
1909	5	859	78,095,000
1910	7	735	51,427,500
1911	5	2,606	210,606,882
1912	13	3,784	182,112,497
1913	17	9,020	477,780,820
1914	22	4,222	199,571,446
1915	12	20,143	1,070,808,628
1916	9	4,439	208,159,689
1917	19	2,486	61,169,962
1918	8	3,519	242,090,800
1919	7	244	11,886,779
1920	10	541	21,620,150
1921	14	1,744	63,872,113
1922	12	4,330	329,114,860
1923	10	2,218	87,913,581
1924	11	920	30,223,372
1925	5	11,130	679,679,580
1926	2	40	.....

Table IX—Summary of Foreclosure Sales, 1876 to 1926

Year	Number of roads	Miles	Bonds and stocks
1876	30	3,840	$217,848,000
1877	54	3,875	198,984,000
1878	48	3,906	311,631,000
1879	65	4,909	243,288,000
1880	31	3,775	263,882,000
1881	29	2,617	137,923,000
1882	16	867	65,426,000
1883	18	1,354	47,100,000
1884	15	710	23,504,000
1885	22	3,156	278,394,000
1886	45	7,687	374,109,000
1887	31	5,478	328,181,000
1888	19	1,596	64,555,000
1889	25	2,930	137,815,000
1890	29	3,825	182,495,000
1891	21	3,223	169,069,000
1892	28	1,922	95,898,000
1893	25	1,613	79,924,000
1894	42	5,643	318,999,000
1895	52	12,831	761,791,000
1896	58	13,730	1,150,377,000
1897	42	6,675	517,680,000
1898	47	6,054	252,910,000
1899	32	4,294	267,534,000
1900	24	3,477	190,374,000
1901	17	1,139	85,808,000
1902	20	693	39,788,000
1903	13	555	15,885,000
1904	13	524	28,266,000
1905	6	679	20,307,000
1906	8	262	10,400,000
1907	6	114	13,777,000
1908	5	138	2,547,000
1909	12	2,629	250,033,000
1910	17	1,100	93,660,109
1911	13	1,386	40,741,543
1912	12	661	25,910,990
1913	6	1,159	86,163,850
1914	9	1,470	83,189,500
1915	11	3,914	285,258,782
1916	26	8,355	703,444,855
1917	20	10,963	557,846,348
1918	11	763	24,735,187
1919	8	459	15,479,587
1920	7	380	7,676,200
1921	11	4,173	306,123,942
1922	15	6,151	299,491,646
1923	8	637	14,622,900
1924	14	3,992	269,251,082
1925	6	638	9,965,000
1926	12	12,852	626,662,708

Table X—Railway Equipment Trust Issues in 1926

Arranged in Order of Approval by Interstate Commerce Commission

Road	Series	Amount	Interest Rate	Sold to	Sold to bankers: Price	Sold to bankers: Cost per cent	Offered to public: Price	Offered to public: Yield per cent	Date of trust	Term	Equipment: Locos.	Equipment: Freight cars	Equipment: Pass. cars	Equipment: Other	Total approximate cost
Wabash	F	4,185,000	4½	Kuhn, Loeb & Co.	96.25	5.105	98	4.82			25	2,500	20		$5.855.625
Mobile & Ohio	O	1,200,000	...	Clarke, Dodge & Co.	97			4.55-4.80			9	500	10		1,570,509
Fairport, Painesvile & Eastern		220,000	6	Cleveland Trust Co.	95	7.1			Dec. 1, '24	10		100			220,000
International-Great Northern	A	1,920,000	4½	Kuhn, Loeb & Co.	96.25	5 ⅛	98	4.82		15	5	1,000	10		2,557,797
Missouri Pacific	E	4,830,000	4½	Kuhn, Loeb & Co.	96.25	5 ⅛	98	4.82		15	25	2,000	30	4	6,453,533
New Orleans, Texas & Mexico	B	750,000	4½	Kuhn, Loeb & Co.	96.25	5 ⅛	Placed privately				10	50	12		1,102,341
Baltimore & Ohio	C	8,370,000	4½	Kuhn, Loeb & Co. and Speyer & Co.	97	4.99	98.66	4.71	Feb. 1	15	25	5,000	5		11,191,667
Atlantic Coast Line	E	5,085,000	4½	J. P. Morgan & Co.	97 ⅛	4.96		4.70	Feb. 1	15	45	1,400	73		6,374,865
St. Louis-San Francisco	BB	7,800,000	4½	Speyer & Co. and J. & W. Seligman & Co.	97	4.98	98.53	4.74	Feb. 15	15	35	4,000	14		10,407,317
Chicago & Eastern Illinois	A	900,000	5	Kuhn, Loeb & Co.	99.25	5.12	Placed privately		Feb. 1	15		70			1,200,000
Pittsburgh & West Virginia	1926	2,000,000	4½	Dillon, Read & Co.	97.49	4.9			Mar. 1	15		1,406			2,460,858
Florida East Coast	H	2,700,000	4½	J. P. Morgan & Co.	97 ⅛	4.96		4.70	Mar. 1	15	45	40	29		3,547,640
Southern	AA	6,900,000	4½	Drexel & Co.	97 ⅛	4.975		4.75	Apr. 1	15	61	2,750	50		8,622,000
Long Island	H	1,230,000	4½	Kuhn, Loeb & Co.	97	4.99	Placed privately		Mar. 1	15	7		20	3	1,651,530
Erie	LL	2,190,000	4½	Drexel & Co.	97	4.99		4.80	Mar. 3	15	2		124		2,747,628
Denver & Rio Grande Western	B	1,725,000	5	Kuhn, Loeb & Co. and Blair & Co.	99 ¼	5.104	Placed privately		Mar. 1	15	10	700			2,304,665
New York Central	1925	11,172,000	4½	J. P. Morgan & Co.	97 ½	4.90		4.65	May 15, '25	15		2,500	189		9,732,789
Michigan Central	1925											960	3		2,246,979
Cleveland, Cincinnati, Chic. & St. L.	1925											2,000	25		4,051,723
Delaware & Northern													1		27,850
Minneapolis, St. P. & S. Ste. Marie	M	1,020,000	4½	Pullman Co.	97.79	5.00			May 1	10		600	2		1,372,519
Pennsylvania	D	17,030,000	4½	Kuhn, Loeb & Co.	97	4.99	98 ¾	4.67			200	2,000	234		24,375,010
Illinois Central	M	5,018,000	4½	Kuhn, Loeb & Co.	97.2	4.9	98 ¾	4.67	May 1	15		3,950	8		7,172,100
Southern Pacific	I	5,654,000	4½	Kuhn, Loeb & Co.	97.2	4.862	98 ¾	4.67	June 1	15	28	2,314	55		8,714,594
Baltimore & Ohio	D	7,475,000	4½	Kuhn, Loeb & Co. and Speyer & Co.	97.78	4.815	99.28	4.60	June 1	15	25	3,000	78		10,679,198
Akron, Canton & Youngstown	1926	200,000	4½	Guardian Trust Co.	94 ½	5.38			June 1	15	4				252,105
Norfolk Southern	E	140,000	5	Special Arrangement					Apr. 1	10	5				187,195
Western Maryland*	D	2,278,000	5	Kean, Taylor & Co. Roosevelt & Son and Brinkmann & Co.	100.886	4.8215			May 15	12		1,800			3,402,000
Chicago & Illinois Western*		489,500	5	Competitive bids					Aug. 1	5	2	300			689,500
Erie	MM	356,000	4½	Drexel & Co.	98	4.83			Aug. 16	15			15		448,348
Central of New Jersey*		2,670,000	4½	Blair & Co. (9 bids)	99.517	4.578	100		July 15	15		1,100	35		3,345,688
Georgia & Florida*		750,000	5	Harrison Smith (11 bids)	97.48	5.413				15		530			1,003,000
Weatherford, Mineral Wells & North Western (T. & P.)	A	572,000	5	American Car & Fdy. Co.	Par				Aug. 1	10		280			858,410
Illinois Central*	N	4,665,000	4½	Halsey, Stuart & Co. (2 bids)	98.815		100.09 to 98.93	4.40 4.60	Oct. 1	15	70				6,232,000
I. C. C. refused to sanction sale to Kuhn, Loeb & Co. at 98.43; permitted sale to Kuhn, Loeb & Co. without competitive bidding at 99.517 or sale after competitive bidding with a minimum price of 98.43.															
Chicago, St. Paul, Minneapolis & Omaha*	C. 1926	410,000	4¾	Withdrawn from market					Nov. 1	10	8				550,080
I. C. C. refused to sanction sale to Kuhn, Loeb & Co. at par; permitted sale to Kuhn, Loeb & Co. without competitive bidding at 100.803 or sale after competitive bidding with a minimum price of par.															
Seaboard Air Line	Z 1st lien	9,060,000	4½	Dillon, Read & Co.	95 ¾	5.2097		4.60-4.90	Oct. 1	15	50	3,450	80		11,336,055
	Z 2d lien	2,276,000	5½	Dillon, Read & Co.	97.	6.2075				10					
New York, New Haven & Hartford*	1926	4,995,000	4½	First National Corporation (10 bids)	97.777	4.86			Dec. 1	15	21		93		6,647,517

*Indicates issues for which competitive bids were received.

Equipment Trust Financing

For the past six months the investment market has been watching with greatest interest the results of an interesting—and to many, unwise—experiment being conducted by the Interstate Commerce Commission relative to competitive bidding for railway equipment trust certificates. In the past the railways have usually disposed of their equipment trust issues through their regular banking affiliations without resorting to competitive bidding. The result has been that the larger part of the issues have been sold through Kuhn, Loeb & Co. or J. P. Morgan & Co. to the extent that of the issues sold in the first half of 1926, before the experiment started, the former house participated in about 59 per cent of the issues on a value basis and the latter in about 19 per cent or a total between them of about 78 per cent. Under this method, equipment trust certificates gradually became a preferred investment enjoying a wide market. In June the Western Maryland sold an issue after competitive bidding and was warmly praised for doing so by Division 4 of the commission, namely Commissioners Meyer, Eastman and Woodlock. In July the Central of New Jersey similarly asked for competitive bids on an issue of $2,670,000 4½ per cent equipment trust certificates and awarded them to Blair & Co. as the highest of nine bidders at the attractive price of 99.517.

Illinois Central

The next important event was a refusal of Division 4 in a decision announced in September to sanction the sale of Illinois Central $4,665,000 series N 4½ per cent equipment trust certificates to Kuhn, Loeb & Co. at 98.43. It is said that the Illinois Central could sell them after competitive bidding with that price as a minimum but that if the carrier insisted on selling the certificate to Kuhn, Loeb & Co. without competitive bidding it would have to get the Central of New Jersey price of 99.517. The road elected to try competitive bidding and the issue was sold to Halsey, Stuart & Co. of Chicago, the higher of two bidders at 98.815. At the same time Division 4 also declined to sanction the sale of $410,000 5 per cent Chicago, St. Paul, Minneapolis & Omaha equipment trust certificates also to Kuhn, Loeb & Co. at par, but the Omaha, instead of asking for competitive bids withdrew the issue from the market.

Seaboard Air Line Issue Sold Without Competition

Then in October the Seaboard Air Line was allowed to sell $11,336,000 series Z equipment trust certificates to Dillon, Read & Co., its regular bankers, without the competitive bidding requirement. The reason was that the issue was peculiar in that it was in two parts, there being $9,060,000 4½ per cent first lien certificates for which Dillon, Read & Co. paid 95¾ and $2,276,000 5½ per cent second liens for which the price was 97. The competitive bidding requirement was omitted because of this deviation from standard practice.

New York, New Haven & Hartford

A somewhat different procedure was that adopted by the New York, New Haven & Hartford in connection with its issue of $4,995,000 4½ per cent equipment trust certificates series of 1926. It made an application to the Interstate Commerce Commission and was advised to get competitive bids. It did not advertise for bids but asked a limited number of bankers to bid. Then it sent the bids to Washington and on the commission's advice sold the issue to the First National Corporation of Boston at a price of 97.775, getting a better price, it will be noted, than the Seaboard got for its first lien series Z certificates, but less than the Illinois Central and the Central of New Jersey obtained after competitive bidding. It will thus be seen that prices obtained have gradually declined and it is a fact that the prices of equipment trust certificates have become lower at a time when but for the complication of competitive bidding basic conditions otherwise should have effected the opposite result.

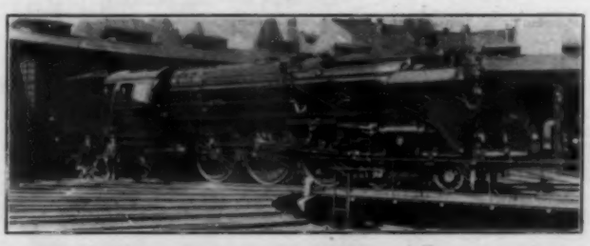
The Results to Date

The commission may or may not believe that it is wrong that two banking houses should have had a near monopoly of this business in equipment trust certificates. Its procedure, however, is frankly an experiment in which it hopes to determine whether competitive bidding will not allow a wider distribution for these so-called standardized securities and thereby permit the railways to borrow their money at a lower rate than under the former arrangement.

It appears that the bankers that have handled most of these equipment trust issues in the past have allowed about 1½ or 1¾ points between the price paid to the railroad and the offering price to the public in order to interest a large number of dealers. This has made for a wider market and it has been the rule for an issue to be disposed of to the ultimate owners—the investors—very rapidly. With competitive bidding the margin has been narrowed to about ½ point or about the same as for municipal securities which means that the banking house offering the highest bid and securing the issue does not find itself in the position to make the sale of the securities as attractive to the distributors as in the other case and which has compelled placing an extreme price for the offering to the public. It appears that in no case have the successful bidders in the several issues sold after competitive bidding been able to dispose promptly of all the certificates purchased by them. In fact, there are rumors that in instances the issues have not been completely distributed even after a lapse of several months. The market has, therefore, become very narrow rather than wider as the commission expected.

Experiment Not Yet Completed

However, the experiment is not yet completed. It is not yet determined whether equipment trust certificates can be sold like state and municipal issues. Inasmuch as the commission has unofficially stated its procedure with reference to competitive bidding to be an experiment it is to be presumed that it will permit a reversal to former accepted methods if the experiment does not work out as expected. In the meantime the status of affairs is such that the railway equipment trust certificate matter is about the only remaining disconcerting factor in the railway securities market as a whole.



A New German Pacific Type

Railroads Purchase One-Fifth of the Annual Lumber Output—Stocks on the Great Northern at Hillyard, Wash.

Railway Supply and Equipment Costs Steady During 1926

End of year finds many prices at slightly lower levels—Outlook problematical—Fluctuations possible

By David A. Steel

Purchases and Stores Editor, *Railway Age*

CONTINUED steadiness in prices throughout 1926 at slightly lower levels than in the previous year, indications of a further increase in railway buying in both equipment and supplies and a future that may see fluctuations in prices, are, briefly, the retrospect and prospect which events of the last 12 months in the material market yield.

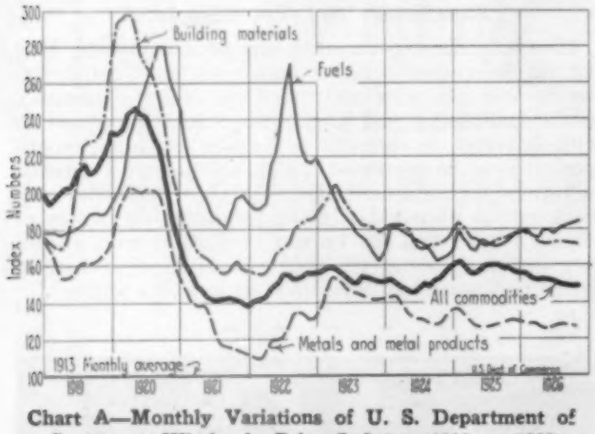


Chart A—Monthly Variations of U. S. Department of Commerce Wholesale Price Indexes, 1919 to 1927

In the general market,* railroad and non-railroad commodity costs as a whole (see Charts A and B) were about 6 per cent below the figures for the previous year which places them about 50 per cent above the figures for 1913. Iron and steel prices in the aggregate did not fall below the 1925 minimums but averaged appreciably less for the season. Pig iron weakened. Steel in-

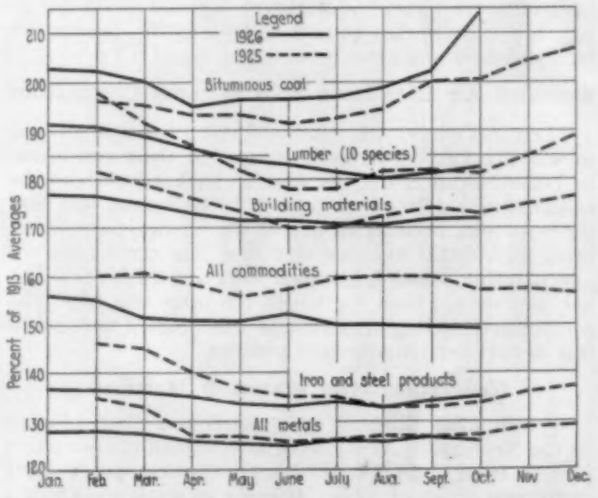


Chart B—Comparative Trends of Wholesale Price Indexes for 1925 and 1926 for Various Classes of Materials as Determined by U. S. Department of Commerce

*This index is made up by the U. S. Bureau of Labor from progressive compilations of wholesale prices of 404 items in representative classes of trade which are consolidated proportionately.

got prices stayed the same. Tin increased about 10 per cent. Copper was a shade lower, lead and zinc were appreciably lower. Rubber dropped 60 per cent over the year. Fuel prices advanced. Lumber prices in the aggregate were slightly higher and building construction materials were appreciably lower.

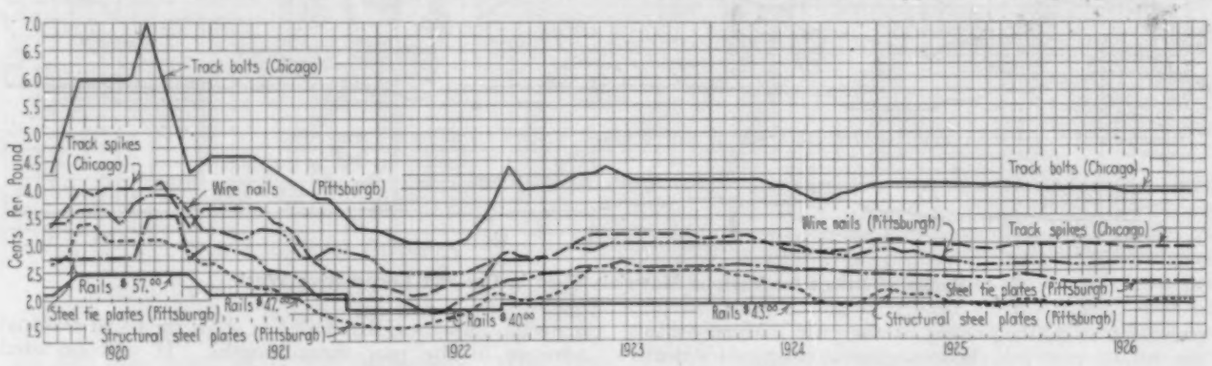
The past year is unquestionably to be cataloged with its two predecessors. These years were notable for the stability of the market as compared with those during and following the war when prices only too well reflected the abnormal conditions in industry. These years did not see the prices return to pre-war levels except in a few cases, but they brought the market into a conspicuous state of quiescence, with prices of commodities changing but little, if any, from month to month or doing so with a deliberation and regularity that has been distinctly comforting to buyers. If the past year in its general aspects is to be distinguished from its predecessors, the distinction lies in the steadiness of prices at slightly lower levels.

This general steadiness of prices is found in the various charts and also in the tabulations given of average prices for representative commodities, but Chart B in particular illustrates the greater stability in the conditions of 1926 than even of 1925. Here, the general price trends for iron and steel products, lumber, building materials, coal, and commodities as a whole during 1926 are compared with those of 1925. In each case the prices are expressed as a percentage of 1913 prices. A glance at this chart quickly discloses that the trends are more uniform for each class of material except coal.

The irregularity in the coal prices was not at all unnatural in view of conditions which have prevailed in that industry. It is remembered that a strike prevailed in the anthracite fields of this country from August, 1925, to March, 1926, when almost no anthracite coal was mined, and that this strike was followed by a cessation of coal mining in Great Britain from August, 1926, to November.

Future Problematical

The even trend of the market in other particulars and the lower price levels, however, unlike the situation in the coal market, stand out somewhat in the nature of contradictions. This will appear from a glimpse of conditions over the country that normally influence prices. The past 12 months was a period of pronounced business activity. Money was easy, production was at a high rate and demand was strong. Records were established in sundry important lines. Until October construction work for the country was unusually heavy. Lumber production as a whole was less than in the previous year, but only by a small margin. Pig iron production exceeded the previous year's output and closely approached the record production of 1923. Coal production was greater than in any year since the war. Automobile production was larger. Freight car loadings reached new high levels and railroad earnings swelled. A well-known business barometer shows an increase of manufacturing for the year while consumption, as indicated by department store and mail order trade, was on a par with the previous year. Also stock and bond prices were higher and so were bank deposits.



Trends of Prices of Iron and Steel Items Used in Roadway and Structures Work

Douglas Fir Mill Prices—Actual Railway Purchases—Year 1926

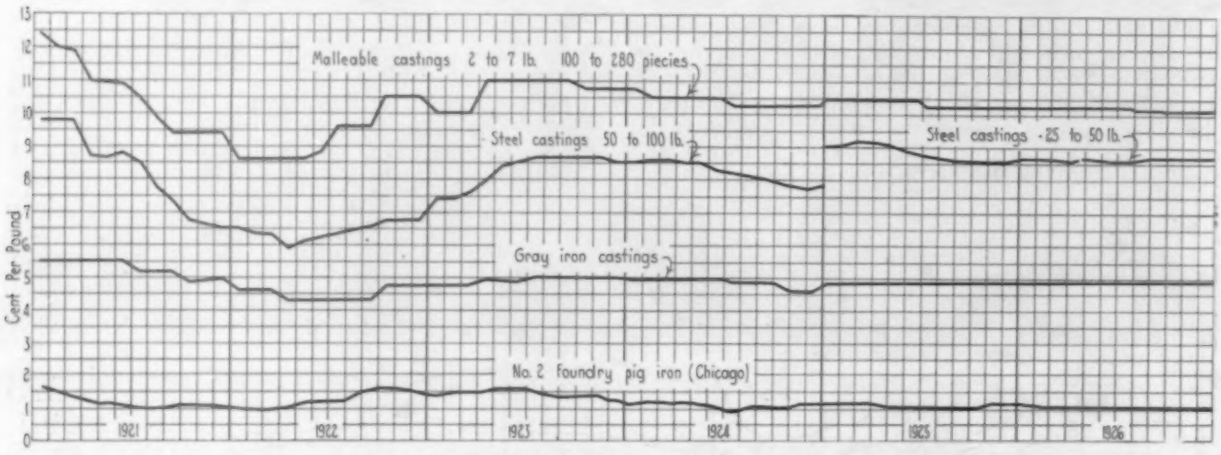
	Dec. *	Jan.	Feb.	March	Apr.	May	June	July	Aug.	Sept.	Oct.
Stringers, 8 by 16, 32 ft., No. 1, common	$19.00	$19.00	$20.00	$20.00	$20.00	$19.50	$20.00	$17.00	$17.00	$17.00	$17.00
Timbers, 12 by 12, 32 ft. and less, No. 1 com.	16.00	17.00	17.00	17.00	17.00	17.00	17.00	17.00	17.00	17.00	17.00
Dimensions, 2 by 6 and 8, No. 1 common	16.00	16.50	16.50	16.50	16.50	16.50	16.50	16.50	16.50	16.50	16.50
Dimensions, 2 by 12, No. 1 common	16.50	16.50	17.00	17.00	17.00	17.00	17.00	17.00	17.00	17.00	17.00
Boards, 1 by 6, No. 1 common	16.00	17.00	17.00	17.00	17.00	17.00	17.00	17.00	17.00	17.00	17.00
Car framing, select common	18.50	19.50	21.00	21.00	21.00	21.00	22.00	21.00	21.00	21.00	21.00
Car sills, 41-45 ft.	22.00	23.00	24.00	25.00	26.00	26.00	26.00	26.00	26.00	26.00	26.00
Car siding, No. 2, clear and better	39.00	40.00	41.00	42.00	42.00	42.00	42.00	42.00	41.00	41.00	41.00
Car lining, select common, D. & M.	22.00	23.50	24.00	24.00	24.50	24.50	25.00	25.00	25.00	25.00	25.00
Car decking, finished, select common, D. & M.	21.00	22.00	23.00	23.00	23.00	22.00	22.00	23.00	23.00	23.00	23.00
Switch ties, common	16.00	16.00	16.50	16.50	16.50	16.50	16.50	16.50	16.50	16.50	17.00
Crossing plank, common	16.00	16.50	16.50	16.50	16.50	16.50	16.50	17.00	17.00	17.00	17.00
Average	$19.80	$20.50	$21.10	$21.13	$21.14	$21.13	$23.10	$21.25	$21.15	$21.15	$21.20

*1925.

Southern Pine Mill Prices—Actual Railway Purchases—Year 1926

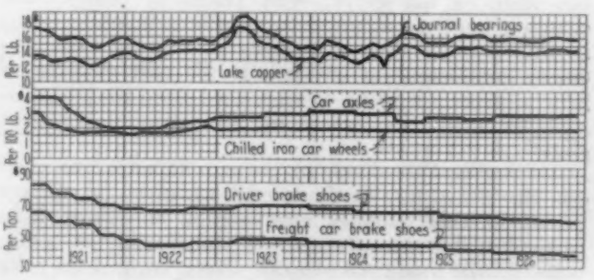
	Jan.	Feb.	March	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Stringers, 7 by 16, 28	$75.00	$75.00	$72.00	$70.00	$70.00	$70.00	$70.00	$70.00	$72.00	$75.00	$75.00	$75.00
Bridge material, 12 by 12, 22	44.00	43.00	43.00	42.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00
Car sills, 36 ft. to 40 ft.	45.00	45.00	44.00	44.00	43.00	43.00	36.00	36.00	36.00	36.00	36.00	36.00
Car lining	38.00	38.00	38.00	38.00	36.00	36.00	36.00	36.00	36.00	36.00	36.00	36.00
Car siding, 9 ft.	55.00	55.00	54.00	54.00	53.00	53.00	52.00	52.00	52.00	51.00	51.00	51.00
Planking, white oak, 3 by 10, 16 ft.	27.00	27.00	27.00	27.00	25.00	25.00	25.00	25.00	27.00	27.00	27.00	27.00
1 by 8, 14 ft.	37.00	37.00	37.00	37.00	37.00	35.00	35.00	36.00	36.00	36.00	36.00	36.00
2 by 4, 10 ft.	32.00	31.00	30.00	30.00	30.00	30.00	31.00	30.00	29.00	29.00	29.00	28.00
2 by 10, 16 ft.	36.00	34.00	33.00	33.00	33.00	32.00	32.00	32.00	32.00	32.00	32.00	31.00
Car decking, 2 in. 10 ft.	35.00	35.00	35.00	34.00	34.00	34.00	34.00	34.00	34.00	33.00	34.00	34.00
Average	$42.40	$42.00	$41.30	$40.90	$40.10	$39.80	$39.10	$39.10	$39.40	$39.50	$39.60	$39.40

It would not have been surprising with these conditions prevalent to have seen prices move up. Some prices did advance. It is a singular fact, however, that in so many cases the market continued from month to month without a change from the lower price levels prevalent at the beginning of the year. More continuous employment and the now general practice for dealers and industries to carry smaller inventories, plus confidence in the continuing stability of the market were unquestionably factors in producing this condition. Increases in plant efficiency, which have enabled producers to handle new business expeditiously were also present. But there have also been evidences of over-capacity in the field, if not over-production, and the general irresponsiveness of the market to the price stiffening influences appears in large part to be but the reflection of it.



Range of Prices for Various Materials Used in Car and Locomotive Work

This condition makes next year's market problematical. There is considerable doubt whether building operations will exceed those of the last year. Building activity declined more quickly last fall than in the fall previous. Imposing retrenchments in automobile production have been made. Unfilled orders of the U. S. Steel Corporation for steel tonnage were 10 per cent less in October than in the same month of the previous year and while continuing to increase since that time, principally because of railroad buying, advanced less than half the expected amount and were lower on November 30, than at the end of any November since 1914. The trade is optimistic about prices and it has been contended frequently that the prevailing prices on many commodities used by railroads do not bring an adequate return on the investment. There is quite a collection of materials, however, that failed to show the usual seasonal advance in the past three months. It is considered significant that of 18 price indexes commonly used as barometers of business in general, 16 were lower in October, 1926, than in the same month in 1925. Among them were those for wheat, corn and cotton.



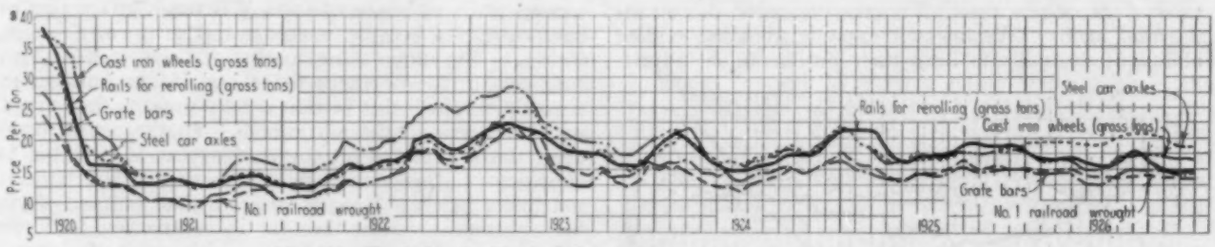
Price Trends of Typical Equipment Items

That there will be no rise in the general average of prices during the new year seems highly probable. But

Average Prices Paid by Railroads for Materials in 1926

Items	Unit	No. Rds.	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Pig iron, No. 2 foundry	N.T.	3	$23.00	$21.83	$21.00	$21.30	$21.30	$20.50	$20.50	$20.50	$20.50	$20.50	$20.50	$20.50
Car axles, 5 by 9 steel	Cwt.	5	2.89	2.89	2.89	2.89	2.89	2.89	2.89	2.89	2.89	2.92	2.92	2.92
Locomotive axles	Cwt.	4	4.75	4.75	4.75	4.55	4.53	4.69	4.65	4.65	4.67	4.54	4.54	4.54
Malleable castings	Cwt.	5	8.21	8.21	8.21	8.08	8.08	8.08	8.08	8.08	8.08	8.08	8.08	8.08
Grey iron castings	Cwt.	4	4.38	4.38	4.38	4.38	4.38	4.38	4.38	4.38	4.38	4.38	4.38	4.38
Steel castings, 25 lb. to 50 lb.	Cwt.	5	8.48	8.48	8.50	8.47	8.50	8.47	8.48	8.48	8.50	8.50	....	....
Driver brake shoes	N.T.	6	63.60	63.60	63.60	63.60	63.60	63.60	62.60	62.60	62.60	61.60	61.60	61.60
Freight car brake shoes	Cwt.	5	1.95	1.95	1.95	1.95	1.95	1.95	1.91	1.91	1.91	1.86	1.86	1.86
Couplers, 5 by 7 by 6½	Pr.	5	19.47	19.37	19.27	19.13	19.13	19.13	19.13	19.13	19.13	19.13	19.13	19.13
Locomotive driving tires	Cwt.	5	6.05	6.05	6.05	6.05	6.05	6.05	6.05	6.05	6.05	6.05	6.05	6.05
Tool steel, high speed	Lb.	5	.61	.61	.61	.61	.61	.61	.61	.61	.61	.61	.61	.61
Steel spring	Cwt.	5	2.63	2.63	2.63	2.63	2.63	2.52	2.52	2.52	2.52	2.52	2.52	2.52
Black sheet steel, No. 28	Cwt.	4	3.39	3.39	3.39	3.37	3.37	3.37	3.25	3.25	3.27	3.32	3.32	3.32
Boiler steel	Cwt	4	2.01	2.01	2.01	1.99	1.99	2.02	2.03	2.03	2.03	2.03	2.03	2.03
Steel pipe, 1 in. galv.	Ft.	4	.075	.078	.078	.093	.080	.080	.080	.080	.080	.080	.080	.080
Pig lead	Cwt.	5	9.71	9.59	8.85	8.56	8.16	8.50	8.83	9.05	8.86	8.51	8.51	8.45
Boiler tubes 2 in. No. 11	Ft.	5	.149	.149	.149	.149	.149	.149	.149	.149	.149	.149	.149	.149
Car oil	Gal.	6	.192	.192	.192	.192	.192	.192	.192	.160	.160	.160	.160	.160
Rod grease	Lb.	5	.121	.121	.121	.121	.121	.121	.121	.120	.120	.120	.120	.120
Waste, colored	Lb.	5	.139	.139	.139	.130	.129	.129	.128	.126	.126	.125	.125	.125
White lead in oil	Lb.	5	.121	.120	.120	.120	.120	.120	.120	.119	.120	.119	.119	.119
Linseed oil, boiled	Gal.	5	.863	.859	.81	.80	.81	.82	.85	.88	.85	.82	.82	.81
Bond wire, 48 in. copper clad	Cwt.	4	16.66	16.66	16.66	16.50	16.50	16.50	16.66	16.66	16.72	16.72	16.72	16.72
Journal bearings	Lb.	2	.155	.153	.156	.153	.152	.153	.152	.158	.157	.156	.153	.154
Copper tubing	Lb.	3	.266	.266	.266	.265	.263	.273	.270	.269	.283	.283	.283	.283
Structural steel angles	Cwt.	3	1.93	1.93	1.93	1.93	1.93	1.93	2.05	2.05	2.05	2.05	....	....
Structural steel—fabricated	Cwt.	2	4.09	3.85	4.00	4.46	4.36	4.35	4.16	3.52	4.45	4.53	....	....
Barbed wire, galvanized	Cwt.	5	3.41	3.41	3.40	3.36	3.36	3.36	3.36	3.33	3.33	3.36	3.36	3.36
Cast iron pipe, 12 in.	N.T.	2	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00	....	....
Vitrified clay pipe, 24 in	Ft.	4	1.24	1.24	1.24	1.32	1.24	1.25	1.07	1.14	1.14	1.14	1.15	1.15

it is not so certain that there will be the steadiness in prices that prevailed last year. A decline of general business would probably cause disturbing fluctuations in price levels. The general prosperity that prevails throughout the country is an insurance against any alarming state of affairs, however, and railroad buying, always large and likely to increase in the next year, will have a decided stabilizing effect. Prevention of a strike in the coal industry next April would do much to avoid severe fluctuations, but a strike seems probable.



Monthly Variation in Typical Scrap Prices in the Last Seven Years

Iron and Steel Prices

The iron and steel market is so large and comprises such a variety of items in operation that anything short of an exhaustive analysis is quite likely to prove inadequate or misleading in certain particulars. What has been said about the general market, however, covers iron and steel fairly well. There has been unusually heavy production, the output of pig iron in the first 10 months of 1926 exceeding that of the corresponding period of 1925 by 8½ per cent, the malleable castings production for the same period being 16 per cent higher, and steel ingot production 10 per cent higher. This production has been encouraged by conditions in all three of the fields to which the bulk of the output goes, namely, the railroads, the automobile industry and general construction.

In 1926, the railroads, which purchase about 25 per cent of all iron and steel tonnage, were again important factors in the market through increases in both the amount of track work called for and in equipment. The number of freight cars ordered dropped from 64,549 in the first 11 months of 1925 to 50,458 in 1926, but the number of passenger cars ordered increased slightly and locomotive orders in the 11 months of 1926 reached 1,143 as compared with 784 in the corresponding period of 1925. The mills had adequate capacity for this business, however, and the result, generally, was weaker though steady prices. It is doubtful if the prices for iron and steel have varied so little in any other year.

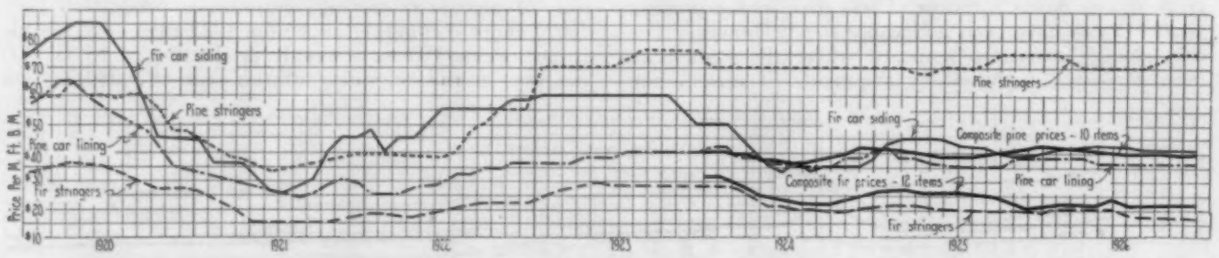
A picture of the conditions in the market for roadway and construction materials is obtainable from one of the accompanying charts. Prices of track bolts, track spikes, tie plates and structural steel plates were slightly less on the average, but in all but the last case the variation in prices from month to month was negligible. In the chart of equipment items, specificially malleable castings, steel castings, grey iron castings and pig iron, practically no change in price throughout the 12 months' period is seen except in the case of malleable castings, which declined.

Exceptions from the usual trends are found in commodities such as boilers and radiators which have advanced considerably since the summer months. A record-breaking activity in the petroleum industry brought appreciable, though in all probability temporary, advances in tank plates and structural steel, advances of 10 per cent or more having developed since August. But on the whole, even the seasonal stiffening of prices has been lacking, and no material changes of prices in iron and steel products are expected next year, except as a result of possible disturbances in business conditions. Scrap prices usually fluctuate more than the prices of iron and steel products, but in 1926, as observed from the chart, the swings were similar to those of the previous year with the general level of prices rather lower than higher.

Further Declines in Fir Prices

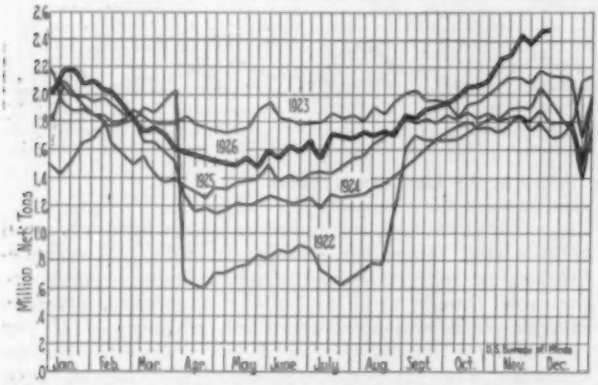
The past year's lumber market is difficult to appraise. An estimate of conditions in one field does not fit another. Prices are from 75 to 100 per cent above pre-war levels, yet impressions of unhealthiness in the industry are still prevalent. On the whole it was a good year from the standpoint of both producers and consumers. The total business done was slightly less than last year but the mills saw prices in the general market stay about the same while the railroads were favored by active competition in the field and by expeditious deliveries.

This is especially true in the Southern pine market, where conditions were probably better than at any time since the war, notwithstanding a reduction in export trade, the collapse of the boom demand for lumber in Florida and the fact that at no time did buyers rush into the market. The range of market prices is disclosed in the table and charts. Reductions in prices occurred in the majority of the items as the season progressed; with stringers regaining the levels held at the close of 1925,



Mill Price Variations of Lumber Items, 1920 to 1927

and the composite price of 10 representative items averaging slightly higher for the season as a whole. The railroads were factors in the Southern pine market during the year but the retail yards continued to constitute the big domestic consumers. In view of this, it is expected that the extremely low price of cotton will influence this year's market through its immediate effect upon business conditions in the South where Southern pine is extensively used. Fir competition is also an influential factor. Weakness is expected, but the evident ability of the mills to keep their production in adjust-



The Trend of Bituminous Coal Consumption During 1926 as Compared with Previous Years, Compiled by the U. S. Bureau of Mines

ment with consumption is expected to keep this market from becoming unsteady.

The Douglas fir market continues to reflect the loss of its great export business and the quieter times on the Pacific coast and a variety of difficulties still beset the producers, judging from a number of business failures which took place in this field during the past year. The effect was seen in further declines in prices over last year in the case of many commodities, and railroads were frequently able to contract their requirements at prices considerably below the going rates. One railroad has, with the exception of car siding, obtained practically all of its fir during the past 12 months at prices from 50 cents to one dollar a thousand less than in the previous year. Prices have been noticeably steady, however (except along the eastern seaboard where the market has been periodically glutted by shipments of unsold lumber), and it continues a buyers' market, although neither the industry nor the railroads, it seems, are profiting by the imperfect standardization of railroad lumber and the growing habit of hand-to-mouth buying in the field where its merits are distinctly open to question.

With hardwoods, the market remained firm.

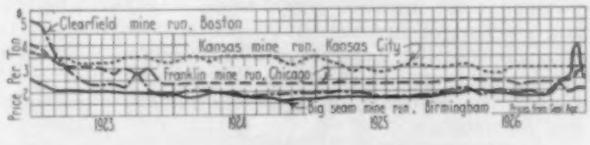
Spotted Conditions in Tie Market

Ties for 1927, of course, have all been purchased, likewise a good percentage of those for 1928 and an appreciable number for 1929 have been contracted for. The last 12 months saw increases effective in many directions in the tie market. In numerous cases these increases occurred in the absence of a competitive market, certain roads voluntarily offering advances of 10 to 15 cents to meet the cost of bringing ties from longer distances. In the south the rains of the previous winter had a strengthening effect on the tie market for that section while in Minnesota and Wisconsin production of hardwood ties became uneconomical at former prices, owing to the diminishing market for the waste. This condition in the northern fields remains unchanged, as a result of which this section is by no means the buyers' market except in the soft woods. In the south, however, the low return on cotton this year is expected to encourage tie production in that section at the same if not lower prices. Reports indicate that railroads have been particularly slow thus far in contracting for their full requirements, a condition which, with the corresponding lack of effort by producers to stock ahead of orders, can have a decided effect upon the market if actual trading should become general.

Treatment of ties continued to increase with two or three new plants placed in operation during the past 12 months and as a result of treatment the number of ties bought each year continued to decline while the proportion of larger and better quality ties to the total continues to increase.

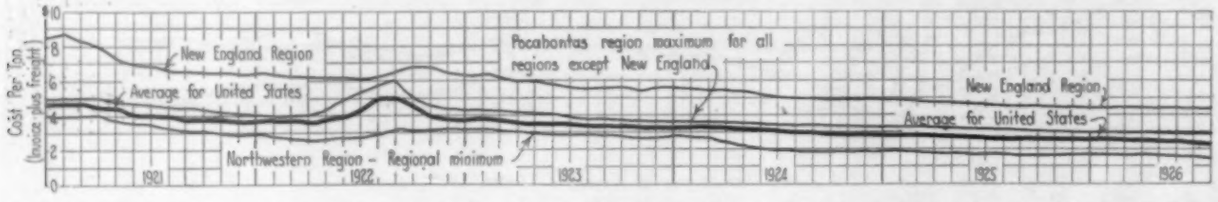
Coal Strike Looked For

The coal market was the spectacle of last year. The anthracite miners of this country were on strike from September, 1925, to February, 1926. Chiefly as a result



Four-Year Range of Representative Spot Coal Prices

of this, the first month and a half of 1926 witnessed a record production of bituminous coal. With the resumption of anthracite mining, bituminous production then fell, though continuing above the 1925 rate. By May 1, it had declined from a weekly production of 13,031,000 net tons at the beginning of the year to 9,039,000 net tons. On May 3, Great Britain became engulfed in a general coal strike which increased the demand for export coal from this country. This strike was practically ended in November, but with a shortage of coal prevalent over Europe, the demand for export coal did not cease so abruptly. To accentuate the situation rumors then became current that a bituminous strike would be called in this country in April, 1927. This rumor was taken seriously and coal storage preparations were inaugurated. The effect was that by September 19, the weekly production of bituminous coal had again passed the high mark,



Variations in the Average Cost of Coal to Railroads from Month to Month, Freight Included, for the Various Railway Regions as Reported by the I. C. C.

and since that time has increased steadily and rapidly reaching a production of 14,728,000 net tons for the week ending December 4, and a total production up to December 4 of 530,232,000 net tons as compared with 478,653,000 in the corresponding period of 1925 and 526,084,000 net tons in the same period of 1923, the year of largest production since the war.

To a certain extent the market was unaffected by this condition, particularly the western fields were glad to get additional business at the going rate. As a consequence largely of the extra capacity of eastern mines, moreover, the British situation did not affect the market in that section until after mid-summer. In fact, some kinds of coal were weaker by reason of an unbalanced demand for screenings and the select grades. From August on, however, as indicated by the accompanying chart of spot prices, the market soared until the break of the strike in November, when equally marked declines took place. The general effect has been to create an average price higher than last year, which the railroads have not altogether escaped, particularly those which have contracted for additional coal in anticipation of a strike. It is interesting to note, however, that largely because of long time contracts they have been enabled generally to avoid the inflated prices of last fall, and in almost every region the average cost of coal received and paid for during the past 12 months, including freight charges, was less than at any time since 1921, reflecting the prices largely contracted for in 1925 rather than in the market of 1926.

It is the consensus of opinion that a strike will be called in the bituminous mines next April. If the strike develops, it will find many roads well prepared, one large road, for example, already having 1,000,000 tons in storage and another road having arranged to have enough coal in storage by April to carry it into fall. This action plus the demonstrated ability of non-union fields to meet normal demands will doubtless moderate the effect of such a strike.

In the market for miscellaneous materials the trends vary as is to be expected from the wide number and variety of commodities involved. Prices in the nonferrous metals remained the same or showed reductions, the price paid by one railroad for lead, for instance, dropping from $9.50 per hundred pounds in January to $8.75 at the close of the year. In paint supplies the cost of white lead, a price-governing commodity, remained the same from month to month, but linseed oil has continued to decrease in price during the year and is considerably below the previous year's level. Linseed oil on one of the roads dropped from a price of $0.85 a gallon in January to $0.79 a gallon at the close of the year. The general market for vitrified clay pipe and similar products was higher during the year. For cast iron pipe, it remained about the same. Creosote oil and gasoline increased in price, while lubricating oils and grease, while increasing on some roads, suffered a general decline.

The prices paid for Portland cement during 1926 varied in different localities and were lower generally than the price level of 1925, but they showed practically no change from month to month, their point of chief interest being in the much lower price at which it was obtainable in Canada where keen competition is met. It is commonly understood that the production of Portland cement in this country will greatly exceed consumption in 1927, in line with policies to increase reserve stock, but what effect this will have on prices remains to be seen.

Equipment Prices

The tables of prices of locomotives, freight cars and passenger cars are given in the usual form. They include only such equipment as has been financed through issues of equipment trust certificates which were approved during 1926 by the Interstate Commerce Commission.

Locomotive Prices in 1926

(See explanatory note in text).

Road	No.	Type	Weight	Tractive force	Builder	Approximate cost	Date of order	Equipment trust series
Akron, Canton & Younstown	2	0-8-0	219,000	51,000	Lima	$42,639	Mar. 1926	1926
	2	2-8-2	303,500	65,700	Lima	83,413	May, 1926	1926
Atlantic Coast Line	5	2-10-2	391,980	75,770	Baldwin	67,686	Nov., 1925	E
	30	4-6-2	280,010	43,115	Baldwin	48,606	Nov., 1925	E
	10	0-8-0	215,300	51,041	Baldwin	40,665	Nov., 1925	E
Baltimore & Ohio	25	2-10-2	.....	.....	Lima and Baldwin	78,000	Dec., 1925	C
	25	2-10-2	.....	.....	Lima and Baldwin	78,748	Dec., 1925	D
Chicago & Illinois Western	2	0-8-0	221,400	51,041	Baldwin	46,250	April, 1926	
Chic., St. Paul, Minn. & Omaha	8	2-8-2	336,000	63,000	American	68,760	June, 1925	C
Denver & Rio Grande Western	10	4-8-2	.....	.....	Baldwin	77,871	Nov., 1925	B
Erie	1	2-8-2	342,000	.....	Baldwin	69,000	1924	LL
	1	4-6-2	308,000	.....	Baldwin	61,000	1924	LL
Florida East Coast	23	4-8-2	360,000	60,500	American	67,500	Apr., 1926	H
	10	4-8-2	319,500	44,000	American	66,750	Jan., 1926	H
	12	0-8-0	218,500	51,000	American	42,000	Feb., 1926	H
Illinois Central	20	4-8-2	367,500	51,121	American	71,100	July, 1926	N
	50	2-8-4	388,000	81,400	Lima	96,200	Aug., 1926	N
International-Great Northern	5	4-6-2	290,000	44,000	American	60,414	Dec., 1925	A
Long Island	7	A.C. Elec.	.....	.....	.....	130,000	.....	H
Missouri Pacific	14	0-8-0 }	224,490	53,958	Lima	{ 44,513	Dec., 1925	E
	1	0-8-0 }				{ 49,613	Dec., 1925	E
	10	2-10-2	420,000	80,000	Baldwin	75,531	Nov., 1925	E
Mobile & Ohio	5	2-8-2	.....	.....	.....	49,567	.....	O
	4	4-6-2	.....	.....	.....	50,250	.....	O
New Orleans, Texas & Mexico	10	2-8-2	333,000	59,800	American	61,454	Dec., 1925	B
New York, New Haven & Hartford	6	A.C. Elec. Sw.	172,000	.....	.....	83,333	.....	1926
	5	A.C.-D.C. Elec.	362,000	.....	.....	139,740	.....	1926
	7	4-8-2	360,000	67,300	American	84,621	Oct, 1926	1926
	3	4-8-2 (3 cyl.)	376,000	67,300	American	89,652	Oct, 1926	1926
Norfolk Southern	5	2-8-0	.....	.....	Baldwin	37,439	Nov., 1926	E
Pennsylvania	175	4-8-2	381,250	64,550	Baldwin }	75,573	March, 1926	D
	25	4-8-2	381,250	64,550	Lima {			
St. Louis-San Francisco	15	2-8-2	349,660	62,950	Baldwin	74,817	Jan., 1926	BB
	10	4-8-2	358,690	54,100	Baldwin	68,692	Jan., 1926	BB
Seaboard Air Line	40	2-8-2	362,000	66,200	Baldwin	62,000	Dec., 1925	Z
	10	4-8-2	326,500	48,200	Baldwin	56,000	.....	Z
Southern	20	2-8-2	326,000	59,900	American	54,250	April, 1926	AA
	12	4-6-2	300,000	45,000	American	58,000	April, 1926	AA
	12	0-8-0	214,000	53,500	Lima	37,850	April, 1926	AA
	10	2-8-0	246,000	54,200	American	51,150	April, 1926	AA
	6	2-8-8-2	450,000	84,400	Baldwin }	80,900	April, 1926	AA
	1	2-8-8-2	448,000	96,000	Baldwin {			
Southern Pacific	23	4-10-2 (3 cyl.)	442,600	.....	American	87,708	.....	I
	5	4-8-2	.....	.....	.....	82,000	.....	I
Wabash	25	0-8-0	217,500	52,921	Lima	42,400	Dec., 1925	F

In the tabulation are included the name of the road, the number of units of equipment purchased, details concerning the type and size, the approximate price of each unit, the name of the builder, the date of the order and the identification of the equipment trust series by which the purchase of the equipment has been financed. The name of the purchaser, the number of units of each type, the approximate prices and the identification of the equipment trust series are obtained from the Interstate Commerce Commission finance dockets. The other material has been supplied by the *Railway Age* from its own equipment tabulations.

Explanatory Note.—The data are given in some detail so that the varying prices may be reconciled with the varying sizes and character of the equipment. It is, of course, impossible in the small space to explain these variations in full, and there may be some cases where cars or locomotives of approximately the same character may be found to have different prices on different orders. The explanation usually is that there is some extenuating factor that does not appear in the records.

Thus, in the case of passenger cars there are instances of two dining cars ordered by the same railroad at the same time one of which will cost more than the other.

Freight Car Prices in 1926

(See explanatory note in text).

Road	No.	Type	Capacity	Construction	Builder	Approximate cost	Date of order	Equipment trust series
Atlantic Coast Line	500	Box	40-ton	St. Frame	Pressed Steel	$1,894	Dec., 1925	E
	500	Gondola	50-ton	Steel	Am. Car & Fdy.	1,580	Nov., 1925	E
	300	Hopper	50-ton	Steel	Pressed Steel	1,666	Dec., 1925	E
	100	Ballast	.....	Steel	Va. Br. & Iron	1,823	Dec., 1925	E
Baltimore & Ohio	1,000	Box	50-ton	Steel	Standard Steel			
	1,000	Box	50-ton	Steel	Bethlehem Steel	1,865	Sept.-Dec., '25	C
	1,000	Box	50-ton	Steel	Bethlehem Steel			
	1,000	Box	50-ton	Steel	Standard Steel			
	1,000	Hopper	55-ton	Steel	Standard Steel	1,540	Sept., 1925	C
	1,000	Hopper	70-ton	Steel	Bethlehem Steel	2,226	Jan., 1926	D
	1,000	Hopper	70-ton	Steel	Balto. Car & Fdy.	2,326	Jan., 1926	D
	500	Auto.-Box	50-ton	Steel	Standard Steel	2,003	May, 1926	D
	500	Auto.-Box	50-ton	Steel	Bethlehem Steel	2,003	May, 1926	D
Central of New Jersey	100	Gondola	70-ton	Steel	Bethlehem Steel	2,435	April, 1926	..
	200	Auto.-Box	50-ton	Steel	Am. Car & Fdy.	2,547	June, 1926	..
	400	Box	50-ton	Steel	Bethlehem Steel and Std. Steel	2,234	June, 1926	..
	400	Box	50-ton	Steel	Bethlehem Steel and Std. Steel	2,243	June, 1926	..
Chicago & Eastern Illinois	500	Hopper	70-ton	Steel	Mt. Vernon	2,400	Aug., 1926	A
Chicago & Illinois Western	200	Gondola	50-ton	St. Und'frame	Ryan	1,870	Feb., 1926	..
	100	Gondola	50-ton	St. Und'frame	Standard Steel	2,230	Feb., 1926	..
Cleveland, Cincinnati, Chic. & St. L.	1,000	Gondola	55-ton	Steel	Pullman	1,691	Nov., 1925	1925
	500	Hopper	55-ton	Steel	Pressed Steel and Ralston	1,631	Feb., 1925	1925
	500	Hopper	55-ton	Steel	Pressed Steel and Ralston	1,626	Feb., 1925	1925
Denver & Rio Grande Western	200	Auto.-Box	50-ton	St. Und'frame	Mt. Vernon	2,441	Nov., 1925	B
	500	Gondola	60-ton	Steel	Pressed Steel	2,075	Nov., 1925	B
Fairport, Painesville & Eastern	100	Hopper	70-ton	Steel	.....	2,200	.....	..
Florida East Coast	40	Caboose	.....	St. Und'frame	Mt. Vernon	4,401	Jan., 1926	H
Georgia & Florida	500	Box	40-ton	St. Frame	Am. Car & Fdy.	1,895	July, 1926	..
	30	Gondola	50-ton	St. Frame	Am. Car & Fdy.	1,850	July, 1926	..
Illinois Central	400	Auto.-Box	40-ton	St. Frame	Am. Car & Fdy. and Pullman	2,239	Jan., 1926	M
	400	Auto.-Box	40-ton	St. Frame	Am. Car & Fdy. and Pullman	2,243	Jan., 1926	M
	500	Gondola	50-ton	St. Und'frame	Pullman, Std. Steel, Ill. Car & Mfg. and Mt. Vernon	2,228	Feb., 1926	M
	500	Gondola	50-ton	St. Und'frame	Pullman, Std. Steel, Ill. Car & Mfg. and Mt. Vernon	2,227	Feb., 1926	M
	500	Gondola	50-ton	St. Und'frame	Pullman, Std. Steel, Ill. Car & Mfg. and Mt. Vernon	2,223	Feb., 1926	M
	500	Gondola	50-ton	St. Und'frame	Pullman, Std. Steel, Ill. Car & Mfg. and Mt. Vernon	2,224	Feb., 1926	M
	100	Auto.-Box	40-ton	St. Frame	Pullman	2,601	March, 1926	M
	50	Auto.-Box	40-ton	St. Frame	Pullman	2,591	March, 1926	M
	50	Auto.-Box	40-ton	St. Frame	Pullman	2,771	March, 1926	M
	50	Caboose	.....	St. Und'frame	Am. Car & Fdy.	2,840	Feb., 1926	M
International-Great Northern	750	Box	40-ton	St. Und'frame	Am. Car & Fdy.	1,974	Nov., 1925	A
	250	Auto.	40-ton	St. Und'frame	Standard Tank	2,117	Nov., 1925	A
Michigan Central	960	Auto.-Box	55-ton	Steel	Standard Steel	2,186	Dec., 1925	1925
Minn., St. Paul & Sault Ste. Marie	500	Box	40-ton	St. Frame	Pullman	2,092	Jan., 1926	M
	100	Gondola	50-ton	St. Frame	Pullman	2,194	Jan., 1926	M
Missouri Pacific	250	Box	40-ton	St. Und'frame	Am. Car & Fdy.	1,974	Nov., 1925	E
	500	Box	40-ton	St. Und'frame	Gen'l Am. and Std. Tank	1,969	Nov., 1925	E
	500	Box	50-ton	St. Und'frame	Gen'l Am. and Std. Tank	2,178	Nov., 1925	E
	250	Auto.	50-ton	St. Und'frame	Am. Car & Fdy.	2,538	Nov., 1925	E
	250	Stock	40-ton	St. Und'frame	Penn. Car	1,877	Nov., 1925	E
	250	Gondola	50-ton	Steel	Am. Car & Fdy.	1,821	Nov., 1925	E
Mobile & Ohio	500	Auto.-Box	40-ton	St. Und'frame	Am. Car & Fdy.	1,825	Jan., 1926	O
New Orleans, Texas & Mexico	50	Gondola	70-ton	Steel	Pressed Steel	2,900	Jan., 1926	m
New York Central	500	Gondola	55-ton	Steel	Standard Tank and Gen'l Amer.	1,689	Nov., 1925	1925
	500	Gondola	55-ton	Steel	Standard Tank and Gen'l Amer.	1,690	Nov., 1925	1925
	1,500	Box	55-ton	Steel	Am. Car & Fdy.	2,130	Nov., 1925	1925
Pennsylvania	600	Auto.-Box	50-ton	Steel	Bethlehem Steel			
	400	Auto.-Box	50-ton	Steel	Pressed Steel	2,137	Apr., 1926	D
	500	Auto.-Box	50-ton	Steel	Am. Car & Fdy.			
	500	Auto.-Box	50-ton	Steel	Ralston			
Pittsburgh & West Virginia	400	Hopper	55-ton	Steel	.....	1,612	.....	1926
	700	Gondola	50-ton	Steel	.....	1,739	.....	1926
	300	Gondola	55-ton	Composite	.....	1,932	.....	1926
	6	Caboose	.....	.....	.....	3,215		
St. Louis-San Francisco	2,000	Box	50-ton	St. Frame	Am. Car & Fdy.	2,065	Nov., 1925	BB
	500	Box	50-ton	St. Und'frame	Gen'l-American	2,059	Nov., 1925	BB
	500	Auto.	50-ton	St. Und'frame	Mt. Vernon and Pullman	2,263	Nov., 1925	BB
	500	Auto.	50-ton	St. Und'frame	Mt. Vernon and Pullman	2,261	Nov., 1925	BB
	500	Gondola	55-ton	St. Frame	Penn. C. & I.	1,645	Oct., 1925	BB
Seaboard Air Line	800	Gondola	50-ton	Steel	Am. Car & Fdy., Pressed Steel and Std. Steel	1,681	Feb., 1926	Z
	800	Gondola	50-ton	Steel	Am. Car & Fdy., Pressed Steel and Std. Steel	1,681	Feb., 1926	Z
	800	Gondola	50-ton	Steel	Am. Car & Fdy., Pressed Steel and Std. Steel	1,660	Feb., 1926	Z
	1,000	Box	40-ton	St. Und'frame	Pressed Steel	2,036	Feb., 1926	Z
	50	Caboose	30-ton	St. Frame	Am. Car & Fdy.	2,780	Apr., 1926	Z
Southern	1,000	Hopper	50-ton	St. Frame	Penn. C. & I.	1,448	Apr., 1925	AA
	250	Ballast	50-ton	Steel	Gen'l-American	1,883	Apr., 1925	AA
	1,500	Box	40-ton	St. Ctr. Sills	Mt. Vernon	1,600	Apr., 1925	AA
Southern Pacific	1,100	Box	.....	St. Und'frame	Pullman	2,005	Mar., 1926	I
	500	Gondola	.....	St. Und'frame	Pressed Steel	1,848	Mar., 1926	I
	350	Stock	.....	St. Und'frame	.....	2,000	.....	I
	300	Flat	.....	St. Und'frame	.....	1,667	.....	I
	64	Caboose	.....	St. Und'frame	.....	3,203	.....	I
Wabash	250	Auto.-Box	40-ton	St. Und'frame	Am. Car & Fdy.	2,232	Nov., 1925	F
	250	Auto.-Box	40-ton	St. Und'frame	Am. Car & Fdy.	2,201	Nov., 1925	F
	500	Auto.-Box	40-ton	St. Und'frame	Am. Car & Fdy.	2,222	Nov., 1925	F
	700	Auto.-Box	40-ton	St. Und'frame	Standard Steel	2,198	Aug., 1925	F
	300	Auto.-Box	40-ton	St. Und'frame	Streator Car	2,197	Oct., 1925	F
Weatherf'd, Mineral Wells & N. West'n	250	Furniture	.....	St. Und'frame	Am. Car & Fdy.	2,828	May, 1926	A
	50	Furniture	.....	St. Und'frame	Am. Car & Fdy.	3,029	May, 1926	A

The explanation in such case may be that the more expensive car had more elaborate interior furnishings.

There will be cases of locomotives of the same type and of approximately the same weight that will vary widely in price. In most of such instances the variation will be explained by a difference in tractive effort which will be apparent in the tabulations. This greater tractive effort without increase in weight may be brought about by greater refinement of design or the addition of certain specialties not put on the less costly locomotive. Variations in price also result from the addition of boosters, stokers, water tube fireboxes, higher boiler pressures, three-cylinder designs, etc.

Similar qualifications will apply in the case of freight cars. There will be instances, especially, where cars having different prices will be found to vary primarily because the more expensive car is of stronger construction.

It will, of course, be recognized that prices at one time of the year may be different from those in another part of the year, and that frequently the prices on larger orders are better than those on smaller ones.

Passenger Car Prices in 1926

(*See explanatory note in text*).

Road	No.	Class	Length	Weight	Builder	Approximate Cost	Date of Order	Equipment Trust Series
Atlantic Coast Line	2	Mail	.....	.....	Pullman	$26,974	Dec., 1925	E
	30	Express	.....	.....	Pullman	20,683	Dec., 1925	E
	5	Mail & Bagg.	.....	.....	Pullman	24,191	Dec., 1925	E
	10	Pass. & Bagg.	.....	.....	Pullman	24,520	Dec., 1925	E
	26	Coaches	.....	.....	Pullman	27,372	Dec., 1925	E
Baltimore & Ohio	4	Dining	.....	.....	.....	47,383	.....	C
	1	Dining	.....	.....	.....	52,135	.....	C
	4	Dining	79 ft.	169,000	Pullman	54,150	Feb., 1926	D
	1	Dining	79 ft.	169,000	Pullman	49,361	Feb., 1926	D
	25	Coaches	79 ft.	151,100	Pullman	28,084	Jan., 1926	D
	15	Pass. & Bagg.	76 ft.	144,800	Pullman	26,755	Jan., 1926	D
	15	Baggage	74 ft.	133,000	Bethlehem Ship.	20,936	Jan., 1926	D
	3	Postal	64 ft.	135,000	Am. Car & Fdy.	28,567	Jan., 1926	D
	3	Mail compt.	74 ft.	138,500	Am. Car & Fdy.	27,935	Jan., 1926	D
	2	Mail compt.	74 ft.	138,500	Am. Car & Fdy.	27,498	Jan., 1926	D
	10	Horse	76 ft.	141,000	Am. Car & Fdy.	25,113	Jan., 1926	D
Central of New Jersey	25	Coaches	72 ft.	115,900	Bethlehem Ship.	23,156	Feb., 1926	..
	5	Pass. & Bagg.	72 ft.	119,000	Pressed Steel	22,588	Feb., 1926	..
	5	Bagg. & Exp.	74 ft.	143,500	Am. Car & Fdy.	22,019	Feb., 1926	..
Cleve., Cincin., Chicago & St. Louis	20	Coaches	70 ft.	131,000	Pullman	27,585	Feb., 1926	1925
	3	Pass. & Bagg.	70 ft.	127,600	Pressed Steel	27,290	Feb., 1926	1925
	2	Dining	73 ft.	170,000	Pullman	49,549	Feb., 1926	1925
Delaware & Northern	1	Gas.-motor	.....	56,000	J. G. Brill Co.	27,850	Sept., 1925	..
Erie	15	Coaches	79 ft.	141,500	Standard Steel	29,900	June, 1926	MM
	100	Coaches	73 ft.	94,200	Standard Steel	18,936	Nov., 1925	LL
	24	Coaches	78 ft.	141,000	Standard Steel	30,167	Nov., 1925	LL
Florida East Coast	8	Baggage	70 ft.	134,500	Pullman	23,350	Feb., 1926	H
	2	Mail	61 ft.	132,300	Pullman	29,900	Feb., 1926	H
	2	Dining	82 ft.	167,200	Pullman	48,000	Feb., 1926	H
	15	Coaches	.....	.....	Second hand	17,000	.....	H
	2	Business	.....	.....	Second hand	25,000	.....	H
Illinois Central	3	Dining	73 ft.	160,000	Pullman	51,060	Mar., 1925	M
	5	Baggage	71 ft.	135,300	Am. Car & Fdy.	20,965	Mar., 1926	M
International-Great Northern	2	Pass. & Bagg.	.....	.....	Am. Car & Fdy.	26,429	Jan., 1926	A
	2	Coach & Chair	.....	.....	Am. Car & Fdy.	31,261	Jan., 1926	A
	2	Pass., mail & bagg.	.....	.....	Am. Car & Fdy.	28,616	Jan., 1926	A
	4	Baggage	70 ft.	.....	Am. Car & Fdy.	18,299	1925	A
Long Island	20	Coaches	63 ft.	79,000	Am. Car & Fdy.	17,740	Dec., 1925	H
Michigan Central	3	Dining	.....	.....	Pullman	49,553	1925	1925
Minn., St. Paul & Sault Ste. Marie	2	Cafe-parlor	83 ft.	166,200	Pullman	53,681	Jan., 1926	M
Missouri Pacific	15	Baggage	70 ft.	129,000	Am. Car & Fdy.	18,139	Oct., 1925	E
	5	Dining	82 ft.	158,250	Pullman	41,741	Oct., 1925	E
	5	Gas-Motor	65 ft.	.....	Sykes Co.	28,000	Apr., 1925	E
	3	Rail-Motor	.....	.....	J. G. Brill Co.	18,300	Apr., 1925	E
	2	Café-Club	.....	.....	Am. Car & Fdy.	41,213	Jan., 1926	E
	4	Coaches	.....	.....	Am. Car & Fdy.	27,461	Jan., 1926	O
Mobile & Ohio	6	Bagg. & Exp.	...	.....	Am. Car & Fdy.	16,555	Jan., 1926	O
New Orleans, Texas & Mexico	2	Coach & Chair	.....	.....	Am. Car & Fdy.	31,262	Jan., 1926	B
	2	Pass. & Mail	.....	.....	Am. Car & Fdy.	29,497	Jan., 1926	B
	2	Baggage	.....	.....	Am. Car & Fdy.	18,310	1925	B
	3	Coaches	.....	.....	Am. Car & Fdy.	30 208	Jan., 1926	B
	3	Compt. Coaches	.....	.....	Am. Car & Fdy.	31,346	Jan., 1926	B
New York Central	35	Coaches	70 ft.	130,400	Pressed Steel	27,535	Dec., 1925	1925
	40	Coaches	.....	.....	Am. Car & Fdy.	27,597	Dec., 1925	1925
	25	Coaches	.....	.....	Osgood-Bradley	27,646	Dec., 1925	1925
	4	Pass. & Bagg.	70 ft.	127,400	Pressed Steel	27,338	Dec., 1925	1925
	32	Bagg. & Mail	.....	.....	Standard Steel	23,093	Dec., 1925	1925
	20	Milk	.....	.....	Merchants Dispatch	8,041	Dec., 1925	1925
	15	Dining	.....	.....	Pullman	49,553	Dec., 1925	1925
	18	Baggage	.....	.....	Company Shops	18,737	Dec., 1925	1925
New York, New Haven & Hartford	25	Motor Pass.	80 ft.	175,500	Osgood-Bradley	72,175	Sept. '25 & Jan. '26	1926
	37	Trailer	80 ft.	104,000	Osgood-Bradley	36,558	Sept. '25 & Jan. '26	1926
	5	Gas. Elec.	.....	110,000	J. G. Brill Co.	48,450	1925	1926
	6	Dining	82 ft.	158,000	Pullman	47,430	Dec., 1925	1926
New York, Westchester & Boston	20	Motor Pass.	72 ft.	126,900	Pressed Steel	45,184	Apr., 1926	1926
Pennsylvania	35	Coaches	80 ft.	.....	{ Pressed Steel / Standard Steel / Pullman }	27,910	Apr., 1926	D
	22	Coaches	80 ft.	131,600				
	17	Coaches	80 ft.	.....				
	7	Pass. & Bagg.	77 ft.	140,000	Pullman	28,467	Apr., 1926	D
	8	Cafe coaches	80 ft.	135,000	Pullman	37,051	Apr., 1926	D
	20	Elec. coaches	64 ft.	123,000	Standard Steel	43,125	Apr., 1926	D
	160	Bagg. & Exp.	63 ft.	88,000	Am. Car & Fdy. / St. Louis Car	12,497	Apr., 1926	D
	25	Bagg. & Exp.	63 ft.	98,000				
St. Louis-San Francisco	14	Coaches	.....	.....	Am. Car & Fdy.	25,366	Nov., 1925	BB
Seaboard Air Line	7	Dining	79 ft.	156,000	Pullman	43,140	June, 1926	Z
	8	Coaches	73 ft.	145,000	Am. Car & Fdy.	30,367	June, 1926	Z
	12	Coaches	73 ft.	145,000	Am. Car & Fdy.	30,235	June, 1926	Z
	15	Express	74 ft.	133,900	Am. Car & Fdy.	25,891	June, 1926	Z
	32	Express	61 ft.	110,300	Pullman	19,972	July, 1926	Z
	6	Pass. & Bagg.	74 ft.	146,800	Am. Car & Fdy.	28,000	Apr., 1926	Z
Southern	25	Coaches	76 ft.	137,500	Pullman	23,700	Apr., 1926	AA
	15	Bagg. & Exp.	63 ft.	110,000	Pullman	14,450	Apr., 1926	AA
	4	Postal	63 ft.	117,500	Pullman	18,700	Apr., 1926	AA
	6	Bagg. & Mail	63 ft.	115,000	Pullman	17,700	Apr., 1926	AA
Southern Pacific	28	Baggage	70 ft.	.....	Pullman	20,671	Mar., 1926	I
	10	Coaches	72 ft.	.....	Pullman	30,441	Mar., 1926	I
	6	Bagg. & Mail	70 ft.	.....	Standard Steel	24,650	Mar., 1926	I
	11	Dining	77 ft.	.....	Pullman	47,762	June, 1926	I
Wabash	20	Baggage	73 ft.	124,000	Am. Car & Fdy.	18,924	Dec., 1925	F

Boston & Albany 2-8-4 Type Locomotive Built by the Lima Locomotive Works

Locomotive Orders in 1926

While the total is higher than last year's it is still below normal

By F. W. Kraeger
Associate Editor, *Railway Age*

LOCOMOTIVES ordered for domestic service in the United States during 1926 totaled 1,301. This compared with 1,055 in 1925, and 1,413 in 1924; with 1,944 in 1923 and with 2,600 in 1922. The number shows a slight increase in 1926 as compared with 1925, but is next to the lowest total on record in the last 12 years, with the exception of the extremely subnormal years of 1919 and 1921.

Orders reported as placed by the railways in Canada with Canadian builders totaled 61, cocpared with 10 in 1925, and 71 in 1924; 82 in 1923, and 68 in 1922. The number ordered, while a substantial increase, is only higher than the totals in 1921 and 1925, two markedly subnormal years.

Table I—Locomotive Orders in 1926

For service in the United States	1,301
For service in Canada	61
For export to other countries	180
Grand total	1,542

Export orders amounted to 171 in 1926, somewhat lower than in 1925, yet the number compares favorably with 1922, 1923, and 1924 orders, being slightly greater.

The number of locomotives built for domestic service —in contradistinction to new business taken as shown in the totals of orders—was 1,585 as against the 1925 total of 994. This figure was inclusive of Canadian production. It compared with 1,810 in 1924, and with 3,505 in 1923.

It is necessary to emphasize the distinction between the total of orders placed and the total of locomotives built. A locomotive takes several months to produce, so that there is, of course, a considerable difference in time be-

Table II—Orders for Locomotives Since 1901

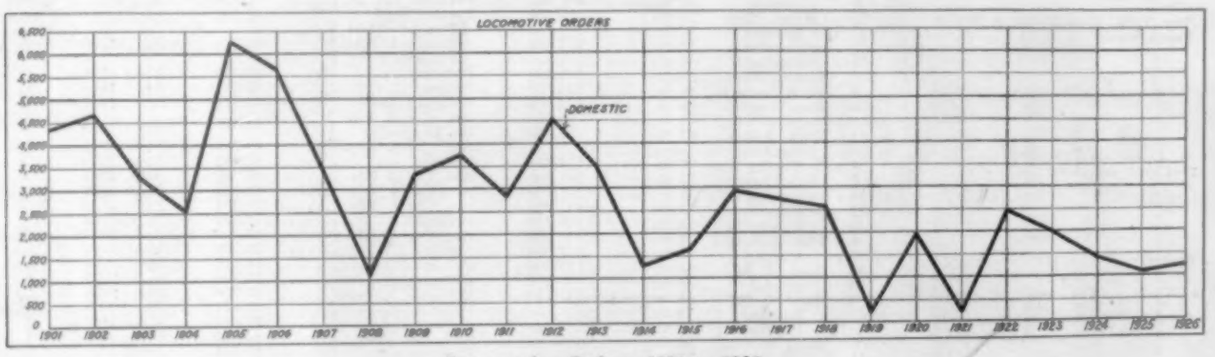
Domestic Orders Only

Year	Locomotives	Year	Locomotives
1901	4,340	1908	1,182
1902	4,665	1909	3,350
1903	3,283	1910	3,787
1904	2,538	1911	2,850
1905	6,265	1012	4,515
1906	5,642	1913	3,467
1907	3,482	1914	1,265

Domestic and Foreign

Year	Domestic	Canadian	Export	Total
1915	1,612	.....	850	2,462
1916	2,910	.....	2,983	5,893
1917	2,704	.....	3,438	6,142
1918	2,593	209	2,086	4,888
1919	214	58	989	1,170
1920	1,998	189	718	2,905
1921	239	35	546	820
1922	2,600	68	131	2,799
1923	1,944	82	116	2,142
1924	1,413	71	142	1,626
1925	1,055	10	209	1,274
1926	1,301	61	180	1,542

Prior to 1918, Canadian orders included under "Domestic."



Locomotive Orders, 1901 to 1926

tween the placing of the order and the date of delivery. Naturally, therefore, because of the overlap at the beginning and at the end of the year, the total of orders placed during a particular year cannot be expected to agree with the total of locomotives produced.

The Car Service Division of the American Railway Association reports monthly totals of locomotive installations and retirements. This also will not agree with the *Railway Age* totals of locomotives ordered or built. This follows because the Car Service Division total covers only Class 1 carriers, whereas the *Railway Age* figures cover all carriers, and also because the Car Service Division's report includes, under installations, locomotives leased from other roads or rebuilt locomotives.

It is apparent that the railroads of this country are ordering their motive power in a conservative manner. A factor tending to decrease the number of locomotives ordered is the increased efficiency and size of the modern motive power unit, as well as their increased utilization. The modern designs, which were more or less in the experimental stage as far as most of the roads were concerned two or three years ago, have found more general acceptance as their efficiency has been proved, and to this fact may be attributed a part of the increase in orders in 1926 over 1925. The fact that railway freight traffic in 1926 broke all previous records also contributed to the increase in locomotive orders. It is noteworthy, however, that in spite of the fact that the ton-miles in October were 9.6 per cent in excess of October, 1925, the busiest month up to that time, there were on October 15, 1926, 2,597 freight locomotives, or 8 per cent of the total number owned, stored in serviceable condition. That such a surplus of power existed, even with the heavy traffic, may explain to some extent why the year's locomotive orders were not larger.

Table III—Locomotives Built in 1926†

Domestic (United States, Canada)	1,585
Foreign	185
Total	1,770

Comparison with Previous Years

Year	Domestic	Foreign	Total	Year	Domestic	Foreign	Total
1896	866	309	1,176	1911*	3,143	387	3,530
1897	865	386	1,251	1912†	4,403	512	4,915
1898	1,321	554	1,875	1913†	4,561	771	5,332
1899	1,951	514	2,475	1914†	1,962	273	2,235
1900	2,648	505	3,153	1915†	1,250	835	2,035
1901	...	...	3,384	1916†	2,708	1,367	4,075
1902	...	...	4,070	1917†	2,585	2,861	5,446
1903	...	...	5,152	1918†	3,668	2,807	6,475
1904	...	...	3,441	1919†	2,162	1,110	3,272
1905*	4,896	595	5,491	1920†	2,022	1,650	3,672
1906*	6,232	720	6,952	1921†	1,185	638	1,823
1907*	6,564	798	7,362	1922†	1,303	231	1,534
1908*	1,886	456	2,342	1923†	3,505	280	3,795
1909*	2,596	291	2,887	1924†	1,810	226	2,036
1910*	4,441	314	4,755	1925†	994	291	1,285
				1926†	1,585	185	1,770

*Includes Canadian output.
†Includes Canadian output and equipment built in railroad shops.

The following paragraph is quoted from the article in last year's Annual Review Number:

"In the lists some few omissions of small unimportant orders doubtless occur. The details presented were supplied by the railways and other purchasers of locomotives in response to inquiries from the *Railway Age*. They were checked against similar lists furnished through the co-operation of the builders, and amplified by reference to the weekly reports in the Equipment and Supplies column of the *Railway Age*. Because of the short time available for the compilation, and the haste necessary to insure publication so close after the end of the year, the *Railway Age* does not desire to make any claims as to the scientifically statistical accuracy of the tabulations or totals drawn from them. However, the real purpose of the statistics is to allow comparisons of the year's business with that of other years, which purpose it is hoped they meet with entire adequacy."

Locomotive Orders in 1926*

For Service in the United States

Purchaser	No.	Type	Service	Weight	Tractive force	Cylinders	Date of order	Date of delivery	Builder
Abilene & Southern	1	2-8-2	.....	176,000	.....	20 x 28	July	.....	American
Akron, Canton & Youngstown	2	2-8-2	Frt.	303,500	65,700	26 x 30	May	September	Lima
	2	0-8-0	Sw.	219,000	51,000	25 x 28	March	August	Lima
Alabama Great Southern	8	2-8-2	Frt.	326,000	59,900	27 x 32	April	May-June	American
	4	4-6-2	Pass.	300,000	45,000	27 x 28	April	July	American
	4	0-8-0	Sw.	214,000	53,500	25 x 28	April	July	Lima
Alaska	2	2-8-2	Pass.	241,500	42,600	22 x 28	July	.....	Baldwin
Alton & Southern	1	2-8-2	.....	275,000	.....	25 x 30	February	.....	American
	1	0-8-0	Sw.	245,000	.....	22 x 28 3 cyl.	June	.....	American
	1	2-8-2	.....	275,000	.....	25 x 30	April	.....	American
	1	2-8-2	.....	275,000	.....	25 x 30	November	.....	American
Atchison, Topeka & Santa Fe	10	2-10-2	Frt.	402,470	85,360	30 x 32	June	August	Baldwin
	15	2-8-2	Frt.	337,880	63,000	27 x 32	June	August	Baldwin
	10	4-8-4	Pass.	.....	.....	.....	November	.....	Baldwin
	15	2-10-2	Frt.	.....	.....	.....	November	.....	Baldwin
	10	4-6-4	Pass.	.....	.....	.....	November	.....	Baldwin
	15	2-8-2	Frt.	.....	.....	.....	November	.....	Baldwin
Baltimore & Ohio	20	4-6-2	Pass.	.....	.....	27 x 28	November	.....	Baldwin
Belt Railway of Chicago	5	0-8-0	.....	.....	.....	.....	October	.....	Baldwin
Bethlehem Steel Co.	1	0-6-0	Sw.	176,000	44,000	23 x 28	November	.....	Baldwin
Birmingham Southeastern	1	2-8-0	.....	138,000	.....	19 x 26	February	.....	American
Birmingham Southern	2	0-6-0	.....	166,000	.....	22 x 26	September	.....	American
	2	0-8-0	.....	203,000	.....	23 x 28	September	.....	American

*Orders dated in 1925 were not included in last year's statistics.

Pressure, 225 lb.
Drivers, 69 in.
Cyls., 27 in. by 30 in.
Wt. drivers, 242,000 lb.
Wt. engine, 362,500 lb.
H't'g surface, 4,949 sq. ft.
Superheater, 1,938 sq. ft.
Grate, 75.3 sq. ft.
Tr. force—Engine, 60,000 lb.
Tr. force—Booster, 72,700 lb.

Built by the American Locomotive Company for the New York Central

Pressure, 220 lb.
Drivers, 64 in.
Cyls., 29½ in. by 32 in.
Wt. drivers, 346,350 lb.
Wt. engine, 440,340 lb.
H't'g surface, 5,270 sq. ft.
Superheater, 1,512 sq. ft.
Grate, 88 sq. ft.
Tr. force, 84,260 lb.

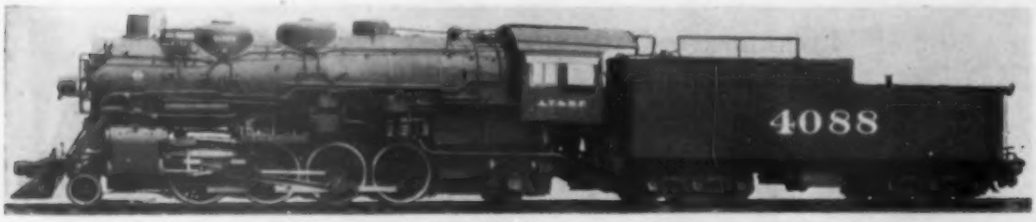
Built by the Baldwin Locomotive Works for the Baltimore & Ohio

Pressure, 210 lb.
Drivers, 63 in.
Cylinders, 30 in. by 32 in.
Wt. drivers, 328,000 lb.
Wt. engine, 420,050 lb.
H't'g surface, 5,000 sq. ft.
Superheater, 1,270 sq. ft.
Grate, 88.4 sq. ft.
Tr. force, 61,500 lb.

Missouri Pacific 2-10-2 Type Built by the Baldwin Locomotive Works

Pressure, 200 lb.
Drivers, 63 in.
Cyls., 25 in. by 28 in. and 32 in.
Wt. drivers, 274,000 lb.
Wt. engine, 394,000 lb.
H't'g surface, 5,010 sq. ft.
Superheater, 1,232 sq. ft.
Grate, 80 sq. ft.
Tr. force, engine, 77,000 lb.
Tr. force, booster, 89,100 lb.

Three-Cylinder 4-8-2 Type Built by the American Locomotive Company



Pressure, 200 lb.
Drivers, 63 in.
Cyls., 27 in. by 32 in.
Wt. drivers, 249,460 lb.
Wt. engine, 337,440 lb.
H't'g surface, 4,587 sq. ft.
Superheater, 1,143 sq. ft.
Grate, 66.8 sq. ft.
Tr. force, 63,000 lb.

Mikado for the A., T. & S. F. Built by the Baldwin Locomotive Works

Pressure, 190 lb.
Drivers, 51 in.
Cyls., 25 in. by 28 in.
Wt. engine, 215,500 lb.
H't'g surface, 2,783 sq. ft.
Superheater, 637 sq. ft.
Grate, 46.9 sq. ft.
Tr. force, 55,500 lb.

Built by Lima Locomotive Works, Inc., for the Southern

Purchaser	No.	Type	Service	Weight	Tractive force	Cylinders	Date of order	Date of delivery	Builder
Bonhomie & Hattiesburg So.	1	2-6-2	Frt.	148,900	28,260	20 x 24	March	.....	Baldwin
Boston & Albany	20	2-8-4	Frt.	389,000	69,400	28 x 30	August	December	Lima
	5	4-6-2	.....	300,000	.....	26 x 28	.....	.....	American
Breece, Geo. E., Lumber Co.	1	Geared	.....	140,000	.....	.....	November	.....	Heisler
Brown, W. P., & Sons Lumber Co.	1	2-8-0	.....	138,000	.....	19 x 26	.....	.....	American
Brownell Improvement Co.	4	0-4-0	.....	80,000	.....	14 x 22	September	.....	American
Bruce, E. L. Co.	1	Geared	.....	72,000	.....	.....	March	.....	Heisler
Buffalo Creek & Gauly	1	2-8-0	Frt.	193,000	41,500	22 x 28	July	.....	Baldwin
Central Steel Co.	1	0-6-0	.....	163,000	.....	21 x 26	May	.....	American
Chicago & Illinois Western	2	0-8-0	Sw.	221,400	51,041	25 x 28	April	August	Baldwin
Chicago & Western Indiana	5	0-8-0	Sw.	261,000	63,600	27 x 30	September	.....	Baldwin
Chicago, Indianapolis & Louisville	6	2-8-2	Frt.	327,000	63,000	27 x 32	June	November	American
Chicago, Rock Island & Pac.	7	2-8-2	Frt.	347,000	63,466	28 x 30	March	June	American
	3	2-8-2	Frt.	351,000	63,466	28 x 30	March	June	American
	5	4-8-2	Pass.	365,000	50,430	28 x 28	March	June	American
	25	2-8-2	.....	351,000	.....	28 x 30	December	1927	American
	10	4-8-2	.....	365,000	.....	28 x 28	December	1927	American
Chicago, St. Paul, Minn. & Omaha	8	2-8-2	Frt.	336,000	63,000	27 x 32	June	November	American
Chicago, West Pull. & Southern	1	0-6-0	.....	.....	.....	.....	May	.....	Baldwin
Cinn., New Orleans & Tex. Pac.	18	2-8-2	Frt.	326,000	59,900	27 x 32	April	May	American
	7	4-6-2	Pass.	300,000	45,000	27 x 28	April	July	American
	6	0-8-0	Sw.	214,000	53,500	25 x 28	April	June-July	Lima
City of St. Louis	1	0-4-0	Sw.	100,000	22,400	16 x 24	June	.....	Baldwin
Cleve., Cinn., Chic. & St. Louis	10	4-6-2	.....	300,000	.....	25 x 28	August	November	American
Columbia Steel Corp.	1	0-4-0	Sw.	78,000	17,360	14 x 22	May	.....	Baldwin
Delaware & Hudson	1	2-8-0	Frt.	340,000	C. 70,800 S. 85,000	C. C. 22¼ x 30 C. C. 38½ x 30	August	December	American
Delaware, Lackawanna & Western	25	4-8-2	Frt.	398,000	.....	25x28 & 32-3 cyl	April	September	American
East Jersey R. R. & Term. Co.	1	0-6-0	Frt.	152,000	33,600	19 x 24	November	Jan., 1927	Baldwin
Essex Terminal Railway	1	0-6-0	.....	145,000	.....	20 x 26	May	.....	American
Fairport, Painesville & East	1	0-6-0	Sw.	160,200	38,500	22 x 26	February	.....	Baldwin
Fisher Delta Log Co.	1	Geared	.....	84,000	.....	.....	August	.....	Heisler
Florida East Coast	12	0-8-0	Sw.	218,500	51,000	25 x 28	February	April	American
	10	4-8-2	Pass. & F.	319,500	44,000	26 x 28	January	April	American
	23	4-8-2	Pass. & F.	360,000	60,300	28 x 30	April	June	American
Fonda, Johnstown & Gloversville	1	0-6-0	.....	152,000	.....	21 x 26	May	.....	American
Georgia, Florida & Alabama	2	2-10-0	Frt.	212,000	46,500	24 x 28	March	.....	Baldwin
Goodwin-Gallagher Sand & G. Co.	2	....	Frt.	.....	.....	11 x 16	December	Feb., 1927	H. K. Porter
	1	....	Frt.	.....	.....	12 x 18	December	Feb., 1927	H. K. Porter
Graysonia, Nashville & Ashdown	1	2-6-0	Frt.	124,000	24,480	19 x 24	September	.....	Baldwin
Great Northern	†17	tenders	.....	21,500g.	.....	.....	January	.....	Gen. Am. Car.
Gulf, Mobile & Northern	2	2-10-0	Frt.	254,000	60,200	25 x 30	October	.....	Baldwin
Hainsport Mining & Transp. Co.	1	0-6-0	Sw.	134,400	32,700	20 x 26	June	.....	Baldwin
	1	0-6-0	Sw.	134,400	32,700	20 x 26	February	.....	Baldwin
Hampton & Branchville	1	4-6-0	Frt.	.....	.....	19 x 26	November	.....	Baldwin
Hartman, Edward	1	2-6-2	.....	.....	.....	.....	January	.....	Baldwin
Illinois Central	20	4-8-2	Pass.	367,500	51,121	28 x 28	July	Oct.-Nov.	American
	50	2-8-4	Frt.	388,000	81,400	28 x 30	August	Nov.-Dec.	Lima
Illinois Northern	1	0-6-0	Sw.	165,000	40,600	22 x 26	May	.....	Baldwin
Illinois Terminal Co.	1	2-6-0	Sw.	182,600	36,700	22 x 26	January	.....	Baldwin
Indiana Harbor Belt	3	Sw.	.....	286,000	87,700	23½x28 & 32 3 cyl	September	December	American
Kansas City Power & L. Co.	1	0-6-0	Sw.	120,000	28,720	19 x 26	October	.....	Baldwin
Kentucky & Indiana Terminal	6	0-8-0	Sw.	219,000	55,500	25 x 28	August	October	Lima
Knickerbocker Portland Cement Co.	1	Geared	.....	64,000	.....	.....	March	.....	Heisler
Lehigh Coal & Nav. Co.	1	0-6-0	Sw.	95,400	19,950	15 x 22	August	.....	Baldwin
Lehigh Portland Cement Co.	1	0-4-0	.....	80,000	.....	14 x 22	.....	.....	American
Longview, Portland & Northern	2	2-8-2	.....	282,000	.....	25 x 30	March	.....	American
Los Angeles & Salt Lake	9	4-10-2	Frt.	404,000	78,000	25x28 & 30-3 cyl	January	June	American
Los Angeles Junction	1	0-6-0	.....	148,000	.....	21 x 26	June	.....	American
Louisiana & Arkansas	2	2-8-2	Frt.	259,000	48,100	24 x 28	November	Jan., 1927	Baldwin
Louisville & Nashville	24	2-8-2	Frt.	323,000	63,000	27 x 32	June	October	American
	8	4-8-2	Pass.	334,240	53,900	27 x 30	June	November	Baldwin
	18	2-8-2	Frt.	323,000	63,000	27 x 32	October	June	American
McCormick, Chas. R., Lumber Co.	1	2-8-2	Frt.	144,000	27,800	18 x 24	April	.....	Baldwin
Michigan Central	10	4-6-2	Pass.	300,000	.....	25 x 28	August	December	American
	10	0-8-0	Sw.	220,000	.....	25 x 28	September	November	American
Mid-Continental Coal Corp.	1	Geared	.....	84,000	.....	.....	November	.....	Heisler
Minn., St. Paul & Sault Ste. Marie	10	4-8-2	.....	336,000	.....	27 x 30	August	November	American
Mobile & Ohio	5	2-8-2	.....	.....	.....	.....	January	.....	Baldwin
	4	4-6-2	.....	.....	.....	.....	January	.....	Baldwin
Modesto & Empire Trac.	1	2-6-0	.....	88,000	.....	16 x 24	February	.....	American
Montana, Wyoming & Southern	1	2-8-0	Frt.	176,000	37,000	21 x 28	November	Jan., 1927	Baldwin
Mud Bay Logging Co.	1	Geared	.....	160,000	.....	.....	June	.....	Heisler
Natchez Col. & Mobile	1	2-8-2	.....	176,000	.....	20 x 28	April	.....	American
Nelson, Chas., Lumber Co.	1	2-8-2	.....	122,000	.....	20 x 24	.....	.....	American
Newburgh & South Shore	2	0-6-0	Sw.	178,000	42,090	22 x 28	May	.....	Baldwin
New Orleans & Northeastern	5	2-8-0	Frt.	216,500	47,000	24 x 30	April	Sept.-Oct.	American
New York Central	1	4-6-4	.....	340,000	.....	25 x 28	August	Jan., 1927	American
	†50	tenders	.....	15,000g.	.....	.....	November	.....	American
New York, Chicago & St. Louis	4	4-6-4	.....	310,000	.....	25 x 26	November	.....	American
New York, New Haven & Hart.	10	4-8-2	.....	374,000	.....	22 x 30 3 cyl.	December	1927	American
Norfolk & Western	10	2-8-8-2	Frt.	555,000	107,373	39 x 32LF	August	December	American
	†30	tenders	.....	16,000g.	.....	.....	October	.....	Company Shops
Norfolk Southern	3	2-8-0	Frt.	.....	.....	22 x 28	November	.....	Baldwin
	5	2-8-0	Frt.	.....	.....	.....	January	.....	Baldwin
Northern Pacific	12	4-8-4	Pass.	430,000	61,600	28 x 30	April	December	American
Nor. Redwood Lumber Co.	1	2-8-2	Log.	189,000	35,200	20 x 24	October	December	American
North River Coal & Wharf Co.	1	0-6-0	Sw.	98,000	22,400	16 x 24	January	.....	Baldwin
Norwood & St. Lawrence	1	2-6-0	Pass.	142,000	28,400	20 x 26	September	.....	Baldwin

† Not included in totals.

Pressure, 200 lb
Drivers, 69 in.
Cyls. 27 in. by 30 in.
Wt., drivers, 231,000 lb
Wt. engine, 344,500 lb.
Heating surface, 3,789 sq. ft.
Superheater, 1,162 sq. ft.
Grate, 103 sq. ft.
Tr. force, 53,900 lb.
Tr. force, booster, 65,700 lb

M., St. P. & S. S. M. Mountain Type Built by American Locomotive Company

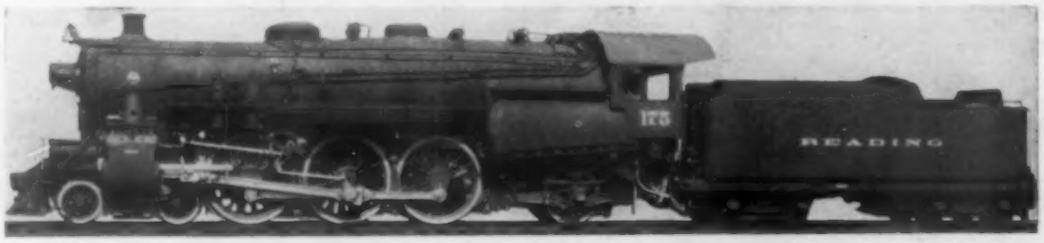
Pressure, 216 lb
Drivers, 67 in.
Cyls. (3) 25 in. by 30 in.
Wt., drivers, 290,530 lb.
Wt., engine, 419,310 lb.
Heating surface, 5,693 sq. ft.
Superheater, 1,495 sq. ft.
Grate, 95 sq. ft.
Tr. force, 75,000 lb.

Three-Cylinder Mountain Type Built by Baldwin Locomotive Works

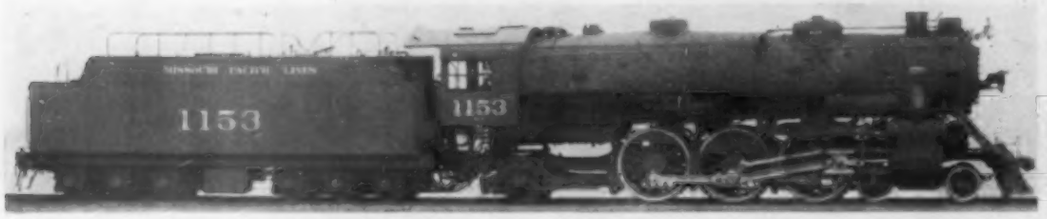
Pressure, 205 lb.
Drivers, 69 in.
Cyls. (3), 22 in. by 30 in.
Wt. drivers, 255,500 lb.
Wt. engine, 374,000 lb.
H't'g surface, 4,320 sq. ft.
Superheater, 1,758 sq. ft.
Grate, 70.8 sq. ft.
Tr. force, 71,000 lb.
McClellon firebox

N. Y., N. H. & H. Three-Cylinder Locomotive Built by American Locomotive Company

Pressure, 220 lb.
Drivers, 80 in.
Cyls., 25 in. by 28 in.
Wt. drivers, 192,540 lb.
Wt. engine, 306,380 lb.
H't'g surface, 3,045 sq. ft.
Superheater, 745 sq. ft.
Grate, 85 sq. ft.
Tr. force, 42,000 lb.



Reading Pacific Type Built by Baldwin Locomotive Works



Pressure, 185 lb.
Drivers, 73 in.
Cyls., 27 in. by 28 in.
Wt. drivers, 190,500 lb.
Wt. engine, 294,000 lb.
H't'g surface, 3,719 sq. ft.
Superheater, 1,054 sq. ft.
Grate, 66.8 sq. ft.
Tr. force, 44,000 lb.

Missouri Pacific 4-6-2 Type Built by American Locomotive Company

Pressure, 200 lb.
Drivers, 63 in.
Cyls., 28 in. by 32 in.
Wt. drivers, 273,500 lb.
Wt. engine, 358,000 lb.
H't'g surface, 4,458 sq. ft.
Superheater, 1,285 sq. ft.
Grate, 80.3 sq. ft.
Tr. force, 67,700 lb.

Chesapeake & Ohio Mikado Built by American Locomotive Company

Purchaser	No.	Type	Service	Weight	Tractive force	Cylinders	Date of order	Date of delivery	Builder
Orange & Fredericksburg	1	2-6-0	.....	88,000	.....	16 x 24	September	.....	American
Ostrander Ry. & Timb. Co.	1	2-6-6-2	Frt.	245,500	42,500	18 & 28 x 24	October	.....	Baldwin
Pacific Portland Cement Co.	1	2-8-2	Frt.	184,600	37,500	20½ x 28	January	.....	Baldwin
Pennsylvania	60	0-6-0	Sw.	180,300	36,144	.....	March	December	Company Shops
	175	4-8-2	Frt.	381,250	64,550	.....	March	December	Baldwin
	25	4-8-2	Pass. & F.	381,250	64,550	27 x 30	March	November	Lima
	40	0-8-0	Sw.	278,000	76,154	.....	July	April, '27	Company Shops
	75	4-6-2	Pass.	308,890	44,460	.....	November	.....	Baldwin
	†100	tenders	.....	13,000g.	.....	.....	January	.....	Baldwin
Peoria & Eastern	2	0-8-0	.....	220,000	.....	25 x 28	.....	.....	American
Pere Marquette	10	2-8-2	Frt.	312,000	54,700	26 x 30	November	February	American
Pittsburgh & Lake Erie	10	4-6-2	.....	300,000	.....	25 x 28	August	December	American
	†20	tenders	.....	16,000g.	.....	.....	November	Feb., 1927	American
Polson Logging Co.	1	2-8-2	Frt.	155,100	35,700	20 x 28	January	.....	Baldwin
Reading	5	4-6-2	Pass.	306,360	42,800	25 x 28	March	July	Baldwin
Richmond, Freder. & Potomac	4	4-6-2	Pass.	333,500	48,580	27 x 28	September	.....	Baldwin
	2	0-6-0	Sw.	172,000	41,200	21 x 28	September	.....	Baldwin
St. Louis & O'Fallon	1	2-6-2	Frt.	.....	.....	20 x 26	November	.....	Baldwin
St. Paul Bridge & Term.	1	0-8-0	Sw.	235,000	49,500	22 x 28	September	.....	Baldwin
Seaboard Air Line	25	0-6-0	Sw.	180,000	45,000	23 x 28	November	.....	Baldwin
Silver Falls Timber Co.	1	2-6-2	Frt.	134,500	22,100	17 x 24	February	.....	Baldwin
Simpson Logging Co.	1	2-6-6-2	Frt.	243,100	42,500	18 & 28 x 24	January	.....	Baldwin
Southern	20	2-8-2	Frt.	326,000	59,900	27 x 32	April	June	American
	12	4-6-2	Pass.	300,000	45,000	27 x 28	April	June-July	American
	10	2-8-0	Frt.	246,000	54,200	22 x 30	April	August	American
	12	0-8-0	Sw.	214,000	53,500	25 x 28	April	June	Lima
	6	2-8-8-2	Frt.	450,000	84,400	25 x 39 x 30	April	July-Sept.	Baldwin
	1	2-8-8-2	Frt.	448,000	96,000	25 x 39 x 30	April	October	Baldwin
Southern Pacific	23	4-10-2	.....	442,000	.....	25x28 & 32-3 cyl	March	.....	American
	5	4-8-2	.....	.....	.....	.....	April	.....	Company Shops
So. Pac. (La. & Tex. Lines)	8	0-6-0	Sw.	155,000	31,020	20 x 26	May	June	Company Shops
Staley, A. E., Mfg. Co.	1	0-8-0	Frt.	210,000	.....	.....	May	November	Baldwin
Standard Slag Co.	1	0-4-0	.....	100,000	.....	16 x 24	March	.....	American
State Purch. Dept. (Sacr., Cal.)	1	0-4-0	.....	65,000	.....	13 x 20	October	.....	American
Stearns Coal & Lumber Co.	1	Geared	.....	110,000	.....	.....	May	.....	Heisler
Tennessee Coal, Iron & Railroad	1	0-6-0	.....	169,000	.....	22 x 26	March	.....	American
	2	0-6-0	Sw.	117,600	25,100	18 x 24	January	.....	Baldwin
Terminal R. R. Assn. of St. Louis	4	0-8-0	Sw.	247,500	60,335	26 x 28	May	Oct.-Dec.	Company Shops
	4	0-8-0	Sw.	247,500	60,335	26 x 28	October	1927	Company Shops
Texas-Mexican	1	4-6-0	Frt.	157,310	30,000	20 x 26	July	.....	Baldwin
Toledo, Angola & Western Railway	1	0-6-0	.....	146,000	.....	21 x 26	June	.....	American
Union Pacific	15	4-12-2	.....	495,000	.....	25x28 & 32-3 cyl	May	.....	American
Union Railroad	6	0-6-0	Sw.	186,000	42,900	22 x 28	May	July	Lima
	4	0-6-0	Sw.	186,000	42,900	22 x 28	May	August	Lima
Union Terminal	1	0-6-0	Sw.	162,000	37,000	22 x 26	June	.....	Baldwin
United Electric Coal Co.	1	Geared	.....	84,000	.....	.....	July	.....	Heisler
U. S. Gypsum Co.	8	2-8-2	.....	121,000	.....	11 x 16	.....	.....	American
	1	0-6-0	Sw.	127,300	31,800	20 x 26	February	.....	Baldwin
Waukegan Generating Co.	1	0-6-0	Sw.	134,000	30,100	19 x 24	May	August	Baldwin
Weirton Steel Co.	1	0-8-0	Sw.	236,000	.....	25 x 30	January	April	American
Western Maryland	20	2-10-0	Frt.	400,000	90,000	30 x 32	November	.....	Baldwin
Western Pacific	5	2-8-2	.....	336,000	.....	28 x 30	January	.....	American

Canada

Purchaser	No.	Type	Service	Weight	Tractive Force	Cylinders	Date of order	Date of delivery	Builder
Alberta & Great Waterways	1	2-10-0	Frt.	206,900	44,600	23½ x 28	Nov., 1925	March	Canadian
Aluminum Co. of Canada	1	2-6-0	.....	160,000	.....	20 x 26	March	.....	Am. (Montreal)
Canadian Pacific	24	4-6-2	Pass.	306,500	45,000	23 x 30	February	October	Am. (Montreal)
	20	2-8-2	Frt.	335,200	57,100	23 x 32	February	November	Canadian
Dominion Bridge Co.	1	0-4-0	.....	80,000	.....	14 x 22	.....	.....	Am. (Montreal)
Eddy, E. B., Co., Ltd.	1	0-4-0	.....	65,000	.....	13 x 20	April	.....	Am. (Montreal)
Lacombe & North-Western	1	2-8-0	Pass. & frt.	168,000	37,400	21 x 28	February	August	Canadian
Quebec Central	3	4-6-2	Pass.	219,900	31,000	22½ x 28	March	May-Oct.	Can. Pac. Shops
	3	2-8-0	Frt.	196,000	36,000	22½ x 28	March	May-Oct.	Can. Pac. Shops
Sydney & Louisburg	2	0-6-0	Sw.	.....	.....	19 x 26	December	1927	Am. (Montreal)
Thurso & Nation Valley	1	2-6-2	Frt.	126,000	24,100	17 x 24	October	Jan., 1927	Am. (Montreal)
U. S. Gypsum Co. (Windsor, N. S.)	3	0-4-0	.....	39,000	.....	10 x 16	September	.....	Am. (Montreal)

Export

Purchaser	No.	Type	Service	Weight	Tractive force	Cylinders	Date of order	Date of delivery	Builder
Al Pacifico (Costa Rica)	2	2-8-0	.....	.....	.....	.....	June	.....	Baldwin
Amaga Compania, del F. C. Cia.	2	2-8-2	.....	.....	.....	.....	April	.....	Baldwin
American Railroad of Porto Rico	1	0-6-0	.....	.....	.....	.....	April	.....	Baldwin
Argentine State	20	2-10-2	.....	.....	.....	.....	October	.....	Baldwin
Brazilian Portland Cement Co.	1	2-4-2	.....	35,000	.....	.....	March	.....	American
Bwana M'Kubwa Copper Co.	1	2-6-2	.....	111,000	.....	15 x 20	February	.....	American
Central Estrada Palma (Cuba)	2	2-8-0	.....	120,000	.....	18 x 24	.....	.....	American
Central of Brazil	8	2-8-2	.....	.....	.....	.....	October	.....	Baldwin
	10	2-8-2	.....	.....	.....	.....	October	.....	Baldwin
	10	4-6-2	.....	.....	.....	3-cyl.	October	.....	Baldwin
	10	4-6-2	.....	.....	.....	3-cyl.	November	.....	Baldwin
	3	2-8-2	.....	.....	.....	.....	November	.....	Baldwin
Cundin Amarcia (Col.)	2	2-8-0	.....	.....	.....	.....	March	.....	Baldwin
Cia Mogyana de Estrados de Ferro	8	2-8-2	.....	121,000	.....	17½ x 20	March	.....	American
	2	4-6-2	.....	113,000	.....	17½ x 20	March	.....	American
F. C. del Guzo Y Santa Ana	2	2-8-2	.....	.....	.....	.....	April	.....	Baldwin
Manilla Railroad	3	4-6-2	.....	.....	.....	.....	October	.....	Baldwin
Newfoundland Railway	1	4-6-2	.....	124,000	.....	18 x 24	August	.....	American
	1	4-6-2	Pass.	123,900	21,600	18 x 24	August	.....	Baldwin
Percatu E. de F. (Brazil)	4	4-6-0	.....	.....	.....	.....	January	.....	Baldwin
Rede de Viacao Sul Mineira (Brazil)	3	2-8-2	.....	121,000	.....	17½ x 20	.....	.....	American
Royal State Railways of Siam	8	4-6-2	.....	.....	.....	3-cyl.	July	.....	Baldwin
Sorocabana Railway (Brazil)	5	4-8-2	.....	203,000	.....	22 x 22	May	.....	American
	10	4-8-2	.....	.....	.....	3-cyl.	April	.....	Baldwin
South African Railways	23	4-8-2	.....	228,000	.....	23 x 28	May	.....	American
Sudoesta de Bahia (Brazil)	3	4-6-2	.....	.....	.....	.....	September	.....	Baldwin
Trinidad Sugar Co. (Cuba)	1	2-6-0	.....	49,000	.....	12 x 18	.....	.....	American
Yunnan Kopei Railway (China)	6	0-5-0	.....	.....	.....	.....	April	.....	Baldwin

† Not included in totals.

Oil-Electric or Diesel Electric Locomotives

Purchaser	No.	Wheel arrangement	Service	Weight	Tractive force	Cylinders No. Dia. and Stroke	Builders
Chicago & North Western	1	0-4-4-0	Sw.	120,000	.....	.....	Ingersoll Rand-Amer.-Gen. Elec.
	1	.....	Sw.	120,000	.....	.....	Ingersoll Rand-Amer.-Gen. Elec.
Erie	1	.....	.....	120,000	.....	.....	Ingersoll Rand-Amer.-Gen. Elec.
Great Northern	1	0-4-4-0	Sw.	200,000	.....	.....	Ingersoll Rand-Amer.-Gen. Elec.
Ingersoll Rand	1	.....	.....	120,000	.....	.....	Ingersoll Rand-Amer.-Gen. Elec.
Inland Steel	1	0-4-0	Sw.	120,000	.....	.....	Ingersoll Rand-Amer.-Gen. Elec.
Long Island	2	0-8-0	Frt.	203,000	60,000	.....	Ingersoll Rand-Amer.-Gen. Elec.
New York Central	1	4-8-4	.....	234,000	.....	.....	Ingersoll Rand-Amer.-Gen. Elec.
	1	4-8-4	.....	268,000	.....	.....	McIntosh & Seymour-Amer.-Gen. Elec.
	1	4-4-4	Frt.	268,000	.....	.....	New Lon. S. & E.-Gen. Elec. Amer.
Lehigh Valley	1	0-4-4-0	Sw.	152,000	40,000	6-8 x 9½	McIntosh & Seymour-Gen. Elec.-Brill
Reading	1	.....	.....	120,000	36,000	.....	Ingersoll Rand-Amer.-Gen. Elec.
Red River Lumber Co.	1	.....	.....	200,000	.....	.....	Ingersoll Rand-Amer. Gen. Elec.
Utah Copper	1	.....	.....	120,000	.....	.....	Ingersoll Rand-Amer.-Gen. Elec.

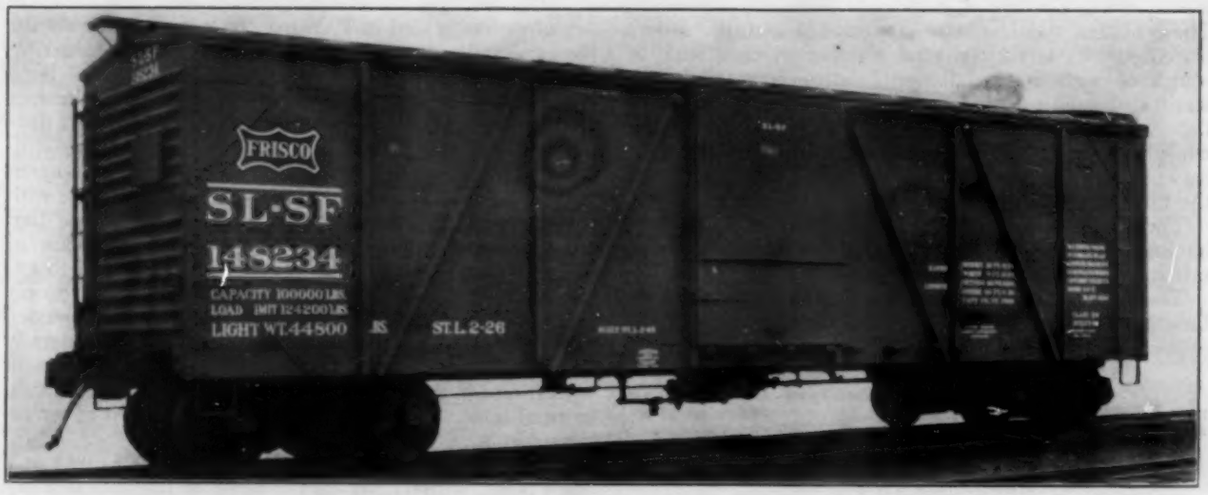
Electric Locomotives

Purchaser	No.	Wheel arrangement	Service	Weight	Tractive force	Voltage	Date of order	Date of delivery	Builder
Baltimore & Ohio	2	0-4-4-0	Frt.	240,000	.....	600 d.c.	.....	.....	General Electric
Carnegie Steel Co.	1	0-4-4-0	Sw.	160,000	40,000	.....	.....	.....	Westinghouse
Chicago, Aurora & Elgin	1	0-4-4-0	Sw.	100,000	25,000	.....	.....	.....	Westinghouse
Great Northern	2	2-6-6-2	Frt.	500,000	.....	11,000 a.c.	.....	.....	Am.-Gen'l-Elec.
Long Island	7	0-6-0	Sw.	300,000	75,000	.....	January	November	Pennsyl. Shops
	1	0-4-4-0	Sw.	50,000	16,500	.....	August	December	West'se El.-Bald.
N. Y., N. H. & Hartford	3	.....	Sw.	172,000	46,000	.....	January	December	West'se El.-Bald.
	5	.....	Pass.	362,000	52,500	.....	January	Dec. & Jan., '27	West'se El.-Bald.
Pennsylvania	2	0-6-6-0	Elec. Sw.	300,000	100,000	.....	January	June	Company Shops
	6	2-8-2	Elec. Pass.	388,000	37,000	.....	January	December	Company Shops
	7	2-8-2	Elec. Pass.	388,000	37,000	.....	April	.....	Company Shops
	4	2-8-2	Elec. Pass.	388,000	37,000	.....	July	.....	Company Shops
	4	2-8-2	Elec. Pass.	388,000	37,000	.....	November	.....	Baldwin
Toledo & Western	1	0-4-4-0	Frt.	125,000	.....	600 d.c.	July	October	General Electric
Utah Copper	1	.....	Sw.	150,000	32,000	.....	July	Feb., '27	General Electric

Export

Purchaser	No.	Wheel arrangement	Service	Weight	Tractive force	Voltage	Date of order	Date of delivery	Builder
Anglo Chilean Cons. Nitrate Corp.	13	0-4-4-0	Frt.	63,000	10,000	.....	April	Aug.-Nov.	Int'l Gen. Elec.
	5	0-4-4-0	Frt. & Pass.	139,000	21,800	.....	April	Feb.-Apr., '27	Int'l Gen. Elec.
Canadian National	1	0-6-0	Frt.& Pass.	136,000	34,000	.....	.....	.....	Westinghouse
Havana Central	1	0-4-4-0	Frt.	120,000	.....	600 d.c.	.....	.....	General Electric
Paulista Railway	8	2-4 + 4-2	Frt.	236,000	59,000	.....	.....	.....	Westinghouse

"Iron City Express," P. R. R., East Bound on Horseshoe Curve, West of Altoona, Pa.



Steel Underframe Single Sheathed Box Car Built for the St. Louis-San Francisco by the American Car & Foundry Company

Freight Car Orders in 1926

Buying declines nearly one-third—Lowest in last five years

By F. W. Kraeger
Associate Editor, *Railway Age*

THE freight cars ordered during 1926 for service in the United States, according to the tabulation of the *Railway Age*, totaled less than 67,500 cars. This compares with 92,816 cars in 1925, 143,728 in 1924 and 94,471 in 1923. This is the lowest since 1921 when 23,000 were reported, and, with the exception of that year and 1919 when 22,062 were reported, it is the lowest reported since 1908 when 62,669 cars were ordered. The orders for Canadian railroads placed with Canadian builders totaled 1,495.

The domestic freight car production totaled 88,862, as compared with 105,935 in 1925 and 113,761 in 1924.

Table I—Freight Car Orders in 1926

For service in the United States	67,029
For service in Canada	1,495
For export to other countries	1,971
Grand total	70,495

Table II—Orders for Freight Cars Since 1901

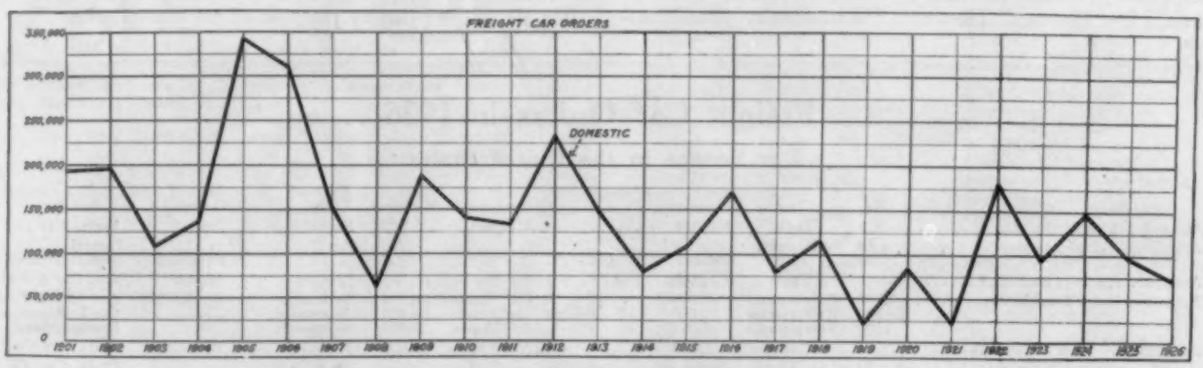
Domestic Orders

Year	Freight cars	Year	Freight cars
1901	193,439	1908	62,669
1902	195,248	1909	189,360
1903	108,936	1910	141,024
1904	136,561	1911	133,117
1905	341,315	1912	234,758
1906	310,315	1913	146,732
1907	151,711	1914	80,264

Domestic and Foreign

Year	Domestic	Canadian	Export	Total
1915	109,792	.....	18,222	128,014
1916	170,054	.....	35,314	205,368
1917	79,367	.....	53,191	132,558
1918	114,113	9,657	53,547	177,317
1919	22,062	3,837	3,994	29,893
1920	84,207	12,406	9,056	105,669
1921	23,346	30	4,982	28,358
1922	180,154	746	1,072	181,972
1923	94,471	8,685	396	105,552
1924	143,728	1,867	4,017	149,612
1925	92,816	642	2,138	95,596
1926	67,029	1,495	1,971	70,495

Prior to 1918, Canadian orders included in domestic.



Freight Car Orders, 1901 to 1926

These figures should not be confounded with the orders placed. Nor should the total number of cars built be compared with the installation of cars, reported in the statistics issued monthly by the Car Service Division of the American Railway Association, as that report included only installations on Class 1 roads, while the *Railway Age* figures include the production of all cars for the railroads, as well as private car lines.

The *Railway Age* totals include only new cars or those having new bodies, whereas the Car Service Division totals include leased and rebuilt cars.

The year 1926 was even more disappointing to the car building industry than 1925, which itself was subnormal.

Table III—Freight Cars Built in 1926

	United States	Canada	Total
Domestic	88,862	1,645	90,507
Foreign	2,771	.....	2,771
Total	91,633	1,645	93,278

Comparison with Previous Years

Year	Domestic	Foreign	Total
1899	117,982	1,904	119,886
1900	113,070	2,561	115,631
1901	132,591	4,359	136,950
1902	161,747	2,800	162,599
1903	153,195	1,613	152,801
1904	60,955	1,995	60,806
1905*	162,701	5,305	165,155
1906*	236,451	7,219	240,503
1907*	280,216	9,429	284,188
1908*	75,344	1,211	76,555
1909*	91,077	2,493	93,570
1910*	176,374	4,571	180,945
1911*	68,961	3,200	72,161
1912†	148,357	4,072	152,429

*Includes Canadian output.
†Includes Canadian output and equipment built in company shops.

	United States			Canadian			Grand
	Domestic	Foreign	Total	Domestic	Foreign	Total	Total
1913	176,049	9,618	185,667	22,017	.....	22,017	207,684
1914	97,626	462	98,088	6,453	.....	6,453	104,451
1915	58,226	11,916	70,142	1,758	2,212	3,970	74,112
1916	111,516	17,905	129,421	.....	.....	5,580	135,001
1917	115,705	23,938	139,643	3,658	8,100	11,758	151,401
1918	67,063	40,981	108,044	14,704	1,960	16,664	124,708
1919	94,981	61,783	156,764	6,391	30	6,421	163,185
1920	60,955	14,480	75,435	.....	.....	.....	.....
1921	40,292	6,412	46,704	8,404	745	9,149	55,853
1922	66,289	1,126	67,415	458	100	558	67,973
1923	175,748	2,418	178,166	.....	.....	.....	.....
1924	113,761	1,141	114,902	1,721	.....	1,721	116,623
1925	105,935	3,010	108,945	.....	.....	.....	.....
1926	88,862	2,771	91,633	1,645	.....	1,645	93,278

Table IV is tabulation of orders.

In the latter part of 1925 there was a sizable buying movement of equipment which did not occur during 1926.

The failure to buy new freight equipment is significant, in view of the increase in traffic in 1926. There would appear to be a continuation of an attitude on the part of the railroads that while there is some increase in traffic, until the increase draws on the surplus cars to a more alarming degree than it has, they will not place orders to increase a supply of equipment which they find adequate to handle the heavy volume of freight traffic in an efficient manner. However, the unusually small number of orders placed in 1926 may be taken to account for the expectation that a number of roads, now considering additions to their rolling stock for next year, will issue inquiries in the near future. Much is made of the fact that the freight car surplus practically disappeared during the peak movement.

The attitude of refraining from purchase of equipment as long as that on hand is adequate to handle traffic with satisfactory efficiency would not appear to be one that can continue for long. Especially is this true in view of the fact that normal buying in former years used to exceed 100,000 cars, and that since 1918 there have only been two years, 1922 and 1924, in which orders passed the 100,000 mark. It is true car utilization has generally grown more efficient, but there is a limit to what efficient operation can do if equipment buying continues on a subnormal level. The orders in 1926 did not even cover replacements.

Buying at the beginning of the year, 1926, was at a high point, with 11,531 cars ordered in January and 11,353 in February, an activity which was a continuation of that at the end of 1925. Beginning with March, 1926, when 7,640 cars were ordered, there was a gradual decline to August, when orders for only 164 were placed. In September, the level of buying rose to over 2,000 but less than 3,000, and remained there until December when it rose to over 5,500.

The following tables contain a detailed statement of orders placed for new freight cars with the builders during 1926 by the railroads and industrial companies; also those placed in Canada and for export. The list of orders was compiled from information furnished to the *Railway Age* by the railroads, private car lines, and other owners of cars, in response to requests for this information. The data thus furnished was then checked against lists of orders supplied by the car builders, and amplified accordingly, and also against the weekly reports of orders appearing in the Equipment and Supplies column of the *Railway Age*. The figures of production were secured in response to requests made to the car builders for this information. As in former years, the *Railway Age* is especially indebted to the American Railway Car Institute in securing the reports of the companies affiliated with that organization.

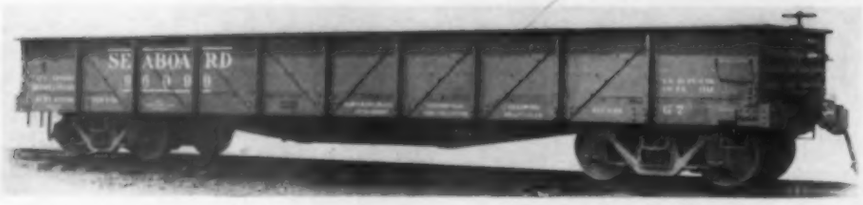
In last year's annual review number the following statement appeared: "The *Railway Age* is not sufficiently optimistic as to believe that the lists can include all the orders placed or that the figures of production are of scientific accuracy. It feels that such accuracy would be next to impossible, in view of the short space of time permitted for the compilations due to the desirability of having the results available at the close of the year with which they deal. However, it is believed that such omissions as occur will be found to be small and unimportant, and will not vitiate the value of the figures, particularly as concerns comparison with preceding years, which, after all, is the primary purpose of the compilations."

Freight Car Orders in 1926

For Service in the United States

Purchaser	No.	Class	Capacity	Length Ft.	Length In.	Construction	Weight	Date of Order	Date of Delivery	Builder
Alexander & Baldwin, Ltd.	1	Tank	100,000	.....		All Steel	.....	May	June	Penn. Car
Aluminum Co. of America	30	Air dump	20 cu. yd.	.....		.....	.....	April	.....	Koppel
	18	Flat	100,000	.....		.....	.....	.....	February	Standard Steel
American Agric. Chemical Co.	1	Tank	7,000g.	28	0	Steel Frame	41,700	January	March	Am. Car & Fdy.
American Refr. Transit Co.	1,000	Refrigerator	80,000	40	0	St. Und'frame	58,000	September	April, 1927	Am. Car & Fdy.
	500	Refrigerator	80,000	40	0	St. Und'frame	58,000	September	.....	Gen'l American
	500	Refrigerator	80,000	40	0	St. Und'frame	58,000	September	.....	Pressed Steel
American Sheet & T. P. Co.	1	Air Dump	100,000	.....		All Steel	58,500	February	February	Clark Car Co.
American Steel & Wire Co.	11	Air Dump	30 cu. yd.	.....		.....	.....	May	.....	Clark Car Co

Purchaser	No.	Class	Capacity	Length Ft.	Length In.	Construction	Weight	Date Order	Date of Delivery	Builder
American Tar Prod. Co	50	Tank	8,000g.	.....		All Steel	.....	April	.....	Standard Tank
Anaconda Copper Mining Co	20	Air Dump	30 cu. yd.	26	0	All Steel	68,000	January	May	Magor
Andes Copper Mining Co	34	Ore	80,000	.....		.....	.....	May	.....	Magor
	26	Tank	.....	.....		All Steel	.....	May	.....	Am. Car & Fdy.
Andrews Steel Co	2	Air dump	30 cu. yd.	.....		.....	.....	.....	.....	Koppel
Anglo-Mexican Pet. Co	5	Tank	10,000g.	.....		All Steel	.....	May	.....	Gen. Amer. Tank
Ansul Chemical Co	2	Tank	30,000	28	0	All Steel	30,100	April	June	Am. Car & Fdy.
	5	Tank	30,000	28	0	All Steel	30,100	September	December	Am. Car & Fdy.
Associated Oil Co	1	Air Dump	30 cu. yd.	.....		.....	.....	October	.....	Clark Car Co.
Armstrong Cork Co	1	Tank	10,000g.	28	0	All Steel	48,200	June	August	Am. Car & Fdy.
Atlantic Coast Line	1,000	Gond.	100,000	41	6	St. Und'frame	40,300	April	August	Am. Car & Fdy.
	30	Caboose	.....	.....		.....	.....	August	.....	Company Shops
	100	Ballast	.....	.....		.....	.....	December	.....	Va. Brid. & Iron
Atlantic Ref. Co	4	Tank	72,000	34	4	All Steel	50,000	October	Jan.,1927	Standard Steel
	6	Tank	63,000	33	8	All Steel	50,000	November	Jan.,1927	Standard Steel
Baltimore & Ohio	1,000	Hoppers	140,000	41	3	All Steel	53,200	January	August	Bethlehem Steel
	1,000	Hoppers	140,000	41	3	All Steel	53,200	January	May	Standard Steel
	500	Auto	100,000	40	6	All Steel	48,600	May	August	Standard Steel
	500	Auto	100,000	40	6	All Steel	48,600	May	November	Bethlehem Steel
	16	Air Dump	20 cu. yd.	.....		.....	.....	April	.....	Koppel
Bang Const. Co	6	Air Dump	20 cu. yd.	.....		.....	.....	January	.....	Koppel
Bangor & Aroostook	100	S. S. Box	80,000	36	0	Steel Frame	40,000	May	June	Company Shops
Barret Co	2	Tank	.....	.....		All Steel	.....	June	October	Gen. Amer. Tank
Birmingham Sou	100	Gondola	140,000	46	0	All Steel	56,600	March	.....	Tenn. C. I. R. R.
Blanton Co	2	Tank	8,000g.	28	0	All Steel	42,000	September	September	Am. Car & Fdy.
Boston & Maine	6	Air Dump	.....	.....		.....	.....	May	.....	Clark Car Co.
	2	Air Dump	.....	.....		.....	.....	May	.....	Clark Car Co.
Boxley, J. V., & Co	8	Air Dump	30 cu. yd.	.....		.....	.....	June	.....	Koppel
Boxley & Sons, W. W	8	Air Dump	20 cu. yd.	.....		.....	.....	June	.....	Koppel
	6	Air Dump	20 cu. yd.	.....		.....	.....	September	.....	Koppel
Bower, Henry, Chem. Co	1	Tank	10,000	.....		All Steel	.....	April	.....	Standard Tank
Broken Hill Proprietary Co	2	Air Dump	.....	.....		.....	.....	May	.....	Clark Car Co.
Brown Co	4	Tank	30,000	.....		All Steel	.....	February	May	Am. Car & Fdy.
Buffalo Creek Lbr. Co	6	N. G. Logg	20,000	19	0	Wood	7,000	May	July	Am. Car & Fdy.
Butte, Anaconda & Pacific	5	Air Dump	100,000	34	0	All Steel	72,200	September	October	W. Wh. Scraper
Calumet & Hecla C. M. Co	5	Hopper Ore	100,000	20	6	Steel	36,800	June	November	Pressed Steel
Canton Car Co	300	Gondola	110,000	42	2	All Steel	41,640	January	June	Am. Car & Fdy.
Carbide & Carbon Chem Corp'n	4	Tank	40,000	40	7	All Steel	84,700	May	September	Am. Car & Fdy.
Carnegie Steel Co	8	Air Dump	100,000	32	3	All Steel	58,000	June	August	Clark Car Co.
Central of New Jersey	100	Gondola	140,000	50	0	All Steel	55,000	April	September	Bethlehem Steel
	400	Box	100,000	40	6	All Steel	47,300	June	November	Standard Steel
	400	Box	100,000	40	6	All Steel	47,300	June	Jan., 1927	Bethlehem Steel
	200	Auto	100,000	40	6	All Steel	52,300	June	November	Am. Car & Fdy.
Certain-teed Products Corp	1	Tank	10,000g.	.....		All Steel	.....	August	September	Am. Car & Fdy.
Champlain Refining Co	5	Tank	6,000g.	.....		All Steel	.....	June	.....	Standard Tank
Chelsea Refg. Co	100	Tank	80,000	.....		All Steel	.....	March	May & June	Penn. Car
Chesapeake & Ohio	500	Gondola	140,000	39	0	Steel Frame	50,000	July	Jan., 1927	Richmond Car
Cheswick & Harmar	10	Hopper	110,000	30	6	All Steel	42,600	October	December	Pressed Steel
Chi. & Bloomington Stone	1	Air Dump	30 cu. yd.	.....		.....	.....	October	.....	Clark Car Co.
Chicago & Eastern Illinois	1	Stock	60,000	36	6½	Wood	378	February	March	Company Shops
	723	Coal	110,000	40	9⅝	St. Und'frame	478	January	.....	Company Shops
	500	Hopper	140,000	39	..	All Steel	564	August	October	Mt. Vernon
	9	Auto	80,000	40	..	St. Und'frame	.....	January	.....	Company Shops
Chicago & Illinois Western	200	Coal	100,000	41	0	St. Und'frame	45,200	February	August	Ryan Car Co.
	100	Coal	100,000	41	0	St. Und'frame	50,400	February	November	Standard Steel
Chicago & North Western	100	Flat	.....	.....		.....	.....	November	.....	Bettendorf
	500	S. D. Stock	60,000	36	6	Steel Frame	37,400	June	October	Ill. Car & Mfg.
	500	S. D. Stock	80,000	36	6	Steel Frame	40,200	September	December	Ill. Car & Mfg.
	1,000	S. S. Auto	80,000	40	6	Steel Frame	47,300	January	August	Company Shops
	150	Ore	140,000	21	1⅜	All Steel	41,000	January	June	Pullman
	250	Ore	140,000	21	1¾	All Steel	41,000	December	April, 1927	Pullman
Chicago, Burlington & Quincy	1,000	Box	.....	.....		.....	.....	January	.....	Pullman
	500	Hopper	100,000	34	4	Steel Frame	44,900	April	October	Am. Car & Fdy.
	500	.....	.....	.....		.....	.....	.....	.....	Company Shops
Chicago Great Western	300	S. S. Box	80,000	40	6	St. Und'frame	42,500	September	June	Pullman
	200	S. S. Auto	80,000	40	6	St. Und'frame	46,000	September	June	Pullman
Chicago, Indianapolis & Louisville	184	S. S. Box	80,000	36	6	Steel Frame	36,300	July	July-Dec.	Company Shops
	200	S. S. Box	80,000	36	6	Steel Frame	37,200	October	Oct.-Dec.	Company Shops
	49	Stock	80,000	36	6	Steel Frame	37,800	April	Feb., 1927	Company Shops
	500	Comp. Gond.	100,000	38	4½	Steel Frame	38,700	April	Feb.-May, 1927	Company Shops
Chicago, Milwaukee & St. Paul	2	Flat	140,000	33	0	St. Und'frame	47,650	.....	July	Standard Steel
	500	Automobile	.....	.....		.....	.....	December	1927	Pullman
	500	Stock	.....	.....		.....	.....	December	1927	Bettendorf
Chi., No. Shore & Mil	4	Caboose	.....	29	0	St. Und'frame	41,500	October	Jan., 1927	Am. Car & Fdy.
	4	Flat	.....	44	0	All Steel	63,000	January	May	Standard Steel
Chic., Rock Island & Pac	188	C. Gond. Bods.	100,000	.....		.....	100,000	July	.....	Bettendorf
Chicago Tank Car	5	Tank	8,000g.	28	0	All Steel	42,200	February	April	Am. Car & Fdy.
	20	Tank	8,000g.	28	0	All Steel	42,200	June	December	Am. Car & Fdy.
	25	Tank	8,000	28	0	All Steel	42,200	November	December	Am. Car & Fdy.
Cities Service Tank Line Co	5	Tank	8,000g.	.....		All Steel	.....	January	.....	Am. Car & Fdy.
	30	Tank	8,000g.	.....		All Steel	.....	October	.....	Am. Car & Fdy.
City of New York	6	Hand Dump	50,000	26	0	All Steel	26,500	June	November	Magor
Cinn, Hamilton & Dayton	15	D. S. Box	80,000	45	8	St. Und'frame	42,800	September	December	J. G. Brill
	25	D. S. Box	80,000	45	8	St. Und'frame	42,800	November	Jan., 1927	J. G. Brill
Clev., Cinn., Chic. & St. Louis	500	Hopper	110,000	30	6	All Steel	42,300	February	May-June	Pressed Steel
	500	Hopper	110,000	30	6	All Steel	42,300	February	May-June	Ralston
Cleve. S. W. Ry. & Light	5	Box	80,000	54	3	St. Und'frame	40,100	May	September	Am. Car & Fdy.
Colorado & Southern	502	S. S. Box	80,000	40	6	Steel Frame	42,400	January	May-June	Pullman
	100	Ballast	82 cu. yd.	33	2	All Steel	44,500	March	June-July	Roger Ballast
	1	Flat	100,000	.....		.....	.....	.....	.....	Company Shops
	50	Flat	80,000	.....		.....	.....	.....	.....	Company Shops
Columbia, Newberry & Laurens	25	S. S. Box	80,000	40	6	St. Und'frame	.....	January	July	Pressed Steel
Columbus & Greenville	6	Box	.....	.....		.....	.....	.....	.....	Company Shops
Commercial Solvents Corp	15	Tank	8,000g.	.....		All Steel	.....	April	.....	Standard Tank
Condon Bros., & Co	10	Air Dump	20 cu. yd.	.....		.....	.....	September	.....	Koppel
Conley Tank Car Co	100	Tank	8,000g.	28	0	All Steel	42,400	March	June	Am. Car & Fdy.
	150	Tank	8,000g.	28	0	All Steel	42,500	November	Feb., 1927	Am. Car & Fdy.
	150	Tank	10,000g.	28	0	All Steel	44,700	November	Feb., 1927	Am. Car & Fdy.



Capacity, 50 tons
Light weight, 40,700 lb.
Inside length, 41 ft. 6 in.
Cubic capacity, 1,112 cu. ft.
Built, June, 1926

Composite Gondola Built by the Pressed Steel Car Company

Capacity, 70 tons
Light weight, 56,400 lb.
Inside length, 39 ft.
Outside length, 39 ft. 8½ in.
Cubic capacity, 2,590 cu. ft.
Continuous center sills of A. R. A. section
Built, July, 1926

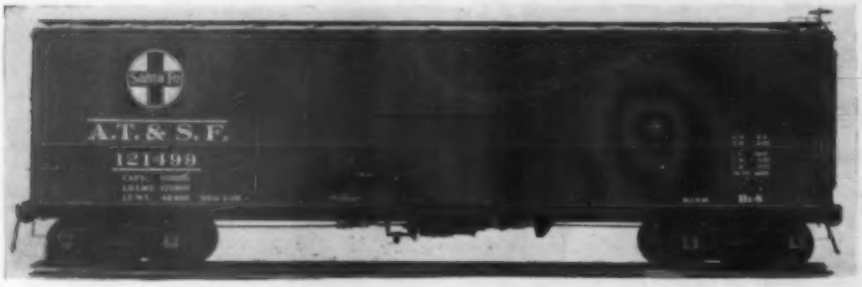
All-Steel Hopper Built by the Mt. Vernon Car & Manufacturing Company

Capacity, 50 tons
Light weight, 42,100 lbs.
Inside length, 41 ft.
Cubic capacity, 1,896 cu. ft.
Built, December, 1926

Composite Drop Bottom Gondola Built by the Bettendorf Company

Capacity, 50 tons
Light weight, 45,200 lb.
Inside length, 40 ft. 9 in.
Cubic capacity, 1,830 cu. ft.
Built, June, 1926

Composite Gondola Built by the Ryan Car Company



Capacity, 50 tons
Light weight, 46,400 lbs.
Width at eaves, 9 ft. 6 in.
Height at eaves, 12 ft. 8⅝ in.
Inside length, 40 ft. 6 in.
Inside width, 8 ft. 7¼ in.
Inside height, 8 ft. 7½ in.
Built, May, 1926

Box Car Built by the General American Car Company

Purchaser	No.	Class	Capacity	Length Ft.	Length In.	Construction	Weight	Date of Order	Date of Delivery	Builder
Consolidated Rendering Co.	1	Tank	6,000g.	.....		All Steel	.....	December	.....	Am. Tank
Continental Tank Car	1	Tank	10,000g.	28	0	All Steel	44,650	November	December	Am. Car & Fdy.
	50	Tank	8,000g.	28	0	All Steel	42,500	November	Jan., 1927	Am. Car & Fdy.
Cook Paint & Var. Co.	1	Tank	60,000	.....		All Steel	.....	February	April	Penn. Car
Cosden & Co.	1	Tank	80,000	27	0	All Steel	43,200	March	May	Am. Car & Fdy.
	5	Tank	100,000	28	0	All Steel	50,900	May	August	Am. Car & Fdy.
	7	Tank	100,000	28	0	All Steel	45,000	May	August	Am. Car & Fdy.
Damascus Mfg. Co.	1	Tank	6,000g.	.....		All Steel	.....	April	.....	Standard Tank
Delaware & Hudson	10	Air Dump	30 cu. yd.	.....		.....	.....	October		Clark Car Co.
Delaware, Lackawanna & Western	25	Caboose	.....	24	3	St. Und'frame	40,000	January	May	Magor
	300	S. S. Box	110,000	40	6	St. Und'frame	44,000	June	Aug.-Sept.	Am. Car & Fdy.
	200	S. S. Box	110,000	40	6	St. Und'frame	44,600	June	Nov.-Dec.	Magor
	400	Hopper	140,000	40	0	St. Und'frame	50,800	June	Sept.-Oct.	Am. Car & Fdy.
	5	Caboose	.....	24	3	St. Und'frame	40,000	June	November	Company Shops
Detroit Edison Co.	4	Hopper	110,000	30	6	Steel	41,860	June	September	Pressed Steel
Dierks L. & C.	8	Flat	60,000	33	0	All Wood	26,900	July	September	Mt. Vernon
Donner Steel Co.	5	Gondola	140,000	34	0¼	All Steel	55,200	September	December	Bethlehem Steel
	10	Gondola	140,000	34	0¼	All Steel	55,200	June	October	Bethlehem Steel
Donora Southern	11	Air Dump	100,000	32	3	All Steel	63,100	April	July	Clark Car Co.
Dow Chemical Co.	4	Tank	10,000g.	28	0	All Steel	44,400	July	September	Am. Car & Fdy.
Du Pont, E. I., De Nemours	4	Tank	.....	.....		.....	.....	.....	March	Am. Car & Fdy.
	2	Tank	30,000	28	0	All Steel	.....	April	June	Am. Car & Fdy.
East Broad Top R. R. & Coal	25	Hopper	70,000	28	0	All Steel	25,000	July	1926-27	Company Shops
	1	Air Dump	100,000	.....		All Steel	58,400	January	January	Clark Car Co.
East Jersey R. R. & Term.	10	Comp. Tank	80,000	32	5⅞	All Steel	37,000	February	Apr.-May	Am. Car & Fdy.
	6	Comp. Tank	80,000	32	5⅞	All Steel	37,000	June	August	Am. Car & Fdy.
	1	Tank	60,000	32	5⅞	All Steel	30,000	June	September	Am. Car & Fdy.
	3	Tank	80,000	32	5⅞	All Steel	33,000	June	August	Am. Car & Fdy.
	4	Box	80,000	40	6	All Steel	30,000	August	November	Am. Car & Fdy.
	2	Flat	80,000	36	0	All Steel	24,000	August	November	Am. Car & Fdy.
	5	Gondola	100,000	40	0	All Steel	27,000	August	November	Am. Car & Fdy.
Empire Gasoline Co.	30	Tank	8,000g.	28	0	All Steel	46,600	October	December	Am. Car & Fdy.
Empire Refineries	5	Tank	8,000g.	28	0	All Steel	46,600	July	November	Am. Car & Fdy.
	30	Tank	8,000g.	.....		.....	.....	October	.....	Gen. Amer. Tank
Enterprise Ry. Equip. Co.	1	Gondola	100,000	41	6	Steel	50,100	April	September	Pressed Steel
	1	Hopper	14,000	40	0	Steel Frame	52,000	June	October	Am. Car & Fdy.
Erie	2	Air Dump	100,000	.....		All Steel	57,900	May	July	Clark Car Co.
Florida East Coast	40	Caboose	.....	33	10	Steel Frame	54,000	January	June	Mt. Vernon
Foley Const. Co.	8	Air dump	30 cu. yd.	.....		.....	.....	May	.....	Koppel
Ft. Worth & Denver City	2	S. S. Box	80,000	40	6	Steel Frame	42,300	April	June	Pullman
Fruit Growers Express	300	Refrigerator	60,000	32	6	St. Cent. Sills	48,100	January	.....	Company Shops
	100	Refrigerator	60,000	32	6	St. Cent. Sills	50,000	September	.....	Company Shops
	1,200	Refrigerator	80,000	33	2¾	St. Und'frame	55,000	September	.....	Company Shops
General Electric Co.	2	Tank	8,000g.	28	0	All Steel	46,700	September	December	Am. Car & Fdy.
General Refractories Co.	2	Flat	.....	16	6	Steel Frame	8,760	February	April	Am. Car & Fdy.
General Sugar Co.	100	Cane	60,000	.....		.....	.....	August	.....	Magor
Georgia & Florida	500	S. S. Box	80,000	40	6	Steel Frame	42,800	July	Oct.-Nov.	Am. Car & Fdy.
	30	Comp. Gond.	100,000	41	6	Steel Frame	42,700	July	November	Am. Car & Fdy.
Gilbert, H. J.	2	Tank	8,000g.	28	0	All Steel	43,600	January	February	Am. Car & Fdy.
	2	Tank	8,000g.	28	0	All Steel	44,200	March	April	Am. Car & Fdy.
Glen Nina Tank Line	3	Tank	6,000g.	.....		All Steel	.....	April	.....	Standard Tank
Goodwin-Gallagher Sand & G. Co.	12	Hopper	100,000	.....		.....	.....	January	.....	Magor
Great Northern	500	.....	.....	.....		.....	.....	December	.....	Company Shops
	100	Flat	.....	.....		.....	.....	October	.....	Company Shops
Gulf Mobile & Northern	12	Air dump	30 cu. yd.	.....		.....	.....	January	.....	Koppel
	30	Box	60,000	.....		.....	.....	.....	.....	Company Shops
Gulf Ref. Co.	4	Gondola	80,000	42	7	All Steel	40,000	October	Jan., 1927	Standard Steel
	8	Gondola	100,000	42	7	All Steel	42,000	October	Jan., 1927	Standard Steel
Hainesport Mining & Trans. Co.	8	Hopper	100,000	21	10	Steel Frame	37,300	January	April	Am. Car & Fdy.
	10	Hopper	100,000	21	10	Steel Frame	37,300	July	September	Am. Car & Fdy.
Hanna, M. A., Co.	5	Dump	.....	34	0	All Steel	64,000	Dec. 1925	May	Differential
Hartol Prod. Corporation	10	Tank	8,000g.	28	0	Steel Frame	40,600	August	August	Am. Car & Fdy.
Heinz, H. J., Co.	5	Tank	80,000	40	0	St. Und'frame	53,400	August	November	Gen. Amer. Tank
Hocking Valley	2	Air dump	.....	.....		.....	.....	May	.....	Case Crane
Hooker Electrochem Co.	4	Tank	60,000	28	0	All Steel	40,600	April	May	Am. Car & Fdy.
	5	Tank	30,000	28	0	All Steel	30,100	November	December	Am. Car & Fdy.
Huron Portland Cement Co.	12	Ore.	100,000	24	9¾	All Steel	.....	April	August	Am. Car & Fdy.
Illinois Central	400	S. S. Box	80,000	40	6	Steel Frame	46,400	January	July	Pullman
	400	S. S. Box	80,000	40	6	Steel Frame	46,400	January	July	Am. Car & Fdy.
	150	S. S. Box	80,000	50	5	Steel Frame	54,900	March	October	Pullman
	50	S. S. Box	80,000	50	2	Steel Frame	57,500	March	October	Pullman
	500	Coal	100,000	41	0	St. Und'frame	50,400	February	Aug.-Sept.	Pullman
	600	Coal	100,000	41	0	St. Und'frame	50,400	February	Oct.-Nov.	Standard Steel
	500	Coal	100,000	41	0	St. Und'frame	50,400	February	Aug.-Nov.	Ill. Car & Mfg.
	500	Coal	100,000	41	0	St. Und'frame	50,400	February	June-July	Mt. Vernon
	50	Caboose	80,000	27	5⅜	St. Und'frame	40,600	February	Aug.-Sept.	Am. Car & Fdy.
	4	Air Dump	24 cu. yd.	30	0	All Steel	62,000	May	September	Differential
	200	Comp. Gd. Bod.	100,000	41	0	Steel Frame	45,600	February	August	Ryan Car Co.
Ill. No. Utilities Co.	1	Air Dump	100,000	.....		All Steel	54,200	March	May	Clark Car Co.
Imperial Refining Co.	100	Tank	80,000	.....		All Steel	39,300	March	May	Penn. Car
Impervious Varnish Co.	1	Comp. Tank	8,000g.	.....		All Steel	.....	January	.....	Standard Tank
Independent Oil & Gas Co.	50	Tank	80,000	.....		All Steel	.....	January	March	Penn. Car
	6	Comp. Tank	8,000g.	.....		All Steel	.....	January	.....	Standard Tank
Indiana Col. & East. Trac.	15	D. S. Box	80,000	45	8	Steel Frame	42,800	November	Mar., 1927	J. G. Brill
Ind. Elect. Corp.	1	Air Dump	100,000	.....		All Steel	58,500	January	January	Clark Car Co.
Indianapolis, Newcastle & East. Tract.	3	Box	8,000	48	0	St. Und'frame	34,100	August	December	Am. Car & Fdy.
Indianapolis Nor. Traction	8	Box	8,000	48	0	St. Und'frame	34,100	August	November	Am. Car & Fdy.
Inland Waterways Corp.	40	Gondola	100,000	43	1½	All Steel	.....	August	December	Tenn. C.I.&R.R.
Jefferson & Clear. C. & I.	1	.....	.....	.....		Steel Frame	.....	November	December	Am. Car & Fdy.
Jones & Laughlin Steel Corp.	9	Tank	20,000g.	.....		All Steel	.....	January	.....	Standard Tank
	3	Tank	8,000g.	.....		All Steel	.....	January	.....	Standard Tank
Kansas City, Mexico & Orient	150	Box	.....	.....		.....	.....	January	.....	Company Shops
Kendall Refining Co.	4	Tank	100,000	.....		All Steel	.....	May	June	Standard Tank
	4	Tank	100,000	.....		All Steel	.....	July	August	Standard Tank
	1	Tank	100,000	.....		All Steel	.....	July	September	Gen. Amer. Tank
	4	Tank	10,000g.	28	0	All Steel	46,100	June	July	Am. Car & Fdy.

Purchaser	No.	Class	Capacity	Length Ft.	Length In.	Construction	Weight	Date of Order	Date of Delivery	Builder
Lehigh Coal & Nav. Co.	1	Air dump	30 cu. yd.	.....		.....	.....	September	.....	Koppel
	4	Air Dump	100,000	.....		All Steel	58,400	December	.....	Clark Car Co.
Lehigh Valley	500	Hopper	140,000	.....		.....	.....	December	1927	Standard Steel
	500	D. S. Box	110,000	.....		.....	.....	December	1927	Am. Car & Fdy.
	200	Automobile	100,000	.....		.....	.....	December	1927	Am. Car & Fdy.
	50	Air Dump	100,000	.....		All Steel	58,400	December	1927	Clark Car Co.
Litchfield & Madison	200	Hop. Bods.	100,000	30	6	Steel Frame	41,000	February	July-Aug.	Ryan Car Co.
Long Island	5	Caboose	.....	29	0	Steel Frame	38,000	November	Mar., 1927	Am. Car & Fdy.
Louisville & Nashville	1,000	D. B. Gond.	100,000	40	6	All Steel	43,200	October	July, 1927	Pressed Steel
	250	Flat	100,000	46	9¾	St. Und'frame	43,700	October	July, 1927	Tenn. C.I.& R.R.
	250	S. S. Auto	100,000	40	6	St. Und'frame	47,500	October	July, 1927	Tenn. C.I.& R.R.
	50	Caboose	.....	.....		.....	.....	August	.....	Company Shops
	20	Air Dump	30 cu. yd.	.....		.....	.....	October	.....	Koppel
Louisville, Henderson & St. Louis	1	Air Dump	80,000	.....		All Steel	71,500	May	May	Differential
	1	Air Dump	80,000	.....		All Steel	71,500	May	July	Differential
	20	Flat	100,000	.....		St. Und'frame	.....	October	June, 1927	Tenn. C.I.& R.R.
	15	Stock	80,000	.....		.....	.....	December	1927	Am. Car & Fdy.
Magnolia Petroleum Co.	100	Tank	10,000g.	28	0	All Steel	51,800	January	April	Am. Car & Fdy.
Mangels Herold Co.	2	Tank	8,000g.	28	0	All Steel	44,300	January	March	Am. Car & Fdy.
Maryland Slag. Co.	4	Air Dump	100,000	.....		All Steel	58,400	July	August	Clark Car Co.
Mathieson Alkali	10	Tank	30,000	28	10½	All Steel	44,300	January	April	Am. Car & Fdy.
Michigan Alkali Co.	10	Tank	10,000g.	28	0	All Steel	44,300	October	December	Am. Car & Fdy.
	16	Air Dump	30 cu. yd.	.....		.....	.....	June	.....	W. Wh. Scraper
Michigan Central R. R.	1,000	Box	110,000	40	6	All Steel	47,200	Dec., 1925	Aug., 1926	Standard Steel
Michigan Ry. Co.	15	D. S. Box	80,000	45	8	St. Und'frame	42,800	January	July	J. G. Brill
Mid-Cont. Coal Corp.	20	Gondola	60,000	30	0	Steel Frame	34,600	September	November	Am. Car & Fdy.
Mid-Continent Pet. Corporation	1	Tank	6,000g.	27	0	All Steel	43,200	March	April	Am. Car & Fdy.
	7	Tank	8,000g.	28	0	All Steel	50,900	June	August	Am. Car & Fdy.
	5	Tank	8,000g.	28	0	All Steel	50,900	June	August	Am. Car & Fdy.
Minneapolis, St. P. & Sault Ste. Marie	500	S. S. Box	80,000	40	0	Steel Frame	42,600	January	August	Pullman
	100	Gondola	100,000	41	6	Steel Frame	48,500	January	July	Pullman
Missouri-Illinois	4	Caboose	60,000	33	10	St. Und'frame	45,100	April	September	Mt. Vernon
	2	Incline Tow	60,000	33	11	St. Und'frame	37,400	April	September	Mt. Vernon
Missouri-Kansas-Texas	500	S. S. Auto	100,000	40	6	Steel Frame	48,000	December	1927	Company Shops
Missouri Pacific	600	D. S. Box	80,000	36	0	St. Und'frame	.....	March	Sept.-Dec.	Penn. Car
	50	Gondola	140,000	45	0	Steel	52,460	January	April	Pressed Steel
	2	Air Dump	.....	.....		.....	.....	May	.....	Koppel
Mobile & Ohio	500	Auto-Box	.....	.....		.....	.....	January	.....	Am. Car & Fdy.
Monroe Sand & Gravel	4	Dump	20 cu. yd.	.....		.....	.....	May	.....	Koppel
Muncie Hart. & Fort Wayne	2	Box	60,000	48	0	St. Und'frame	34,100	August	December	Am. Car & Fdy.
Nashville, Chat. & St. Louis	75	Flat	100,000	39	1¾	St. Und'frame	34,500	March	July	Am. Car & Fdy.
	125	Hop. Coal	110,000	30	6	All Steel	41,100	March	Aug.-Sept.	Am. Car & Fdy.
	100	Hop. Ballast	110,000	30	6	All Steel	46,700	March	August	Rodger Ballast
National Tube Co.	25	Gond. Bods.	120,000	27	6	Steel	32,300	June	October	Pressed Steel
Nevada Consolidated Copper Co.	35	Ore	160,000	26	0	All Steel	50,000	March	September	Magor
New York Central	499	H. S. Gond.	100,000	41	6	All Steel	44,200	Dec., 1925	October	M. D. T. Co.
	500	S. C. Hopp.	110,000	30	6	All Steel	42,600	Dec., 1925	December	M. D. T. Co.
	500	Auto Box	110,000	40	6	All Steel	52,000	February	.....	M. D. T. Co.
	500	H. S. Gond.	110,000	41	6	All Steel	43,500	May	March	M. D. T. Co.
	500	H. S. Gond.	110,000	41	6	All Steel	44,000	October	.....	M. D. T. Co.
	20	Air Dump	100,000	34	0	All Steel	71,067	November	.....	Magor
	30	Air Dump	.....	.....		.....	.....	December	.....	Clark
	10	Air Dump	.....	.....		.....	.....	December	1927	Koppel
N. Y. Rapid Trans. Corporation	10	Flat	.....	48	0	Steel	40,250	October	1927	Pressed Steel
	2	Box	.....	48	0	Steel	52,300	October	1927	Pressed Steel
New Orleans Refining Co.	7	Tank	10,000g.	28	0	All Steel	52,600	May	August	Am. Car & Fdy.
New York, Chicago & St. L.	2	Dump	.....	34	0	All Steel	64,000	April	July	Differential
Norfolk & Western	250	Flat	115,000	42	0	Steel Frame	40,000	July	Oct.-Dec.	Company Shops
	25	Cabin	.....	24	1½	All Steel	43,000	November	.....	Company Shops
	250	Box	100,000	40	6	All Steel	48,000	November	.....	Company Shops
	1,000	Coal	140,000	.....		.....	.....	December	.....	Ralston
	1,000	Coal	140,000	.....		.....	.....	December	.....	Va. Brid. & Iron
Norfolk Southern	150	H. S. Gond.	100,000	41	6	St. Und'frame	40,000	November	Feb., 1927	Va. Brid. & Iron
North American Car Co.	300	Tank	8,000g.	.....		All Steel	.....	June	.....	Bethlehem Steel
	300	Tank	8,000g.	.....		All Steel	.....	December	.....	Bethlehem Steel
Northern Ohio Tr. & Lt. Co.	25	D. S. Box	80,000	45	8	Steel Frame	42,800	January	June	J. G. Brill
Northern Pacific	500	Box	100,000	50	2½	Steel Frame	57,400	March	Sept.-Oct.	Pressed Steel
	500	S. S. Auto	100,000	50	2½	St. Und'frame	54,200	March	Aug.-Sept.	Standard Steel
	200	Sk. Logging	70,000	41	0	All Wood	27,200	Nov., 1925	July, 1926	Company Shops
	200	Sk. Logging	70,000	41	0	All Wood	27,200	May	Sept.-Oct.	Company Shops
Northern Redwood Lumber Co.	1	.....	200,000	41	0	All Steel	66,000	April	.....	Pac. Car & Fdy.
	50	Flat	80,000	41	0	St. Cent. Sills	33,500	April	.....	Pac. Car & Fdy.
Northern Refr. Car Co.	201	Refrigerator	.....	.....		.....	.....	November	.....	Pullman
Northwestern Refrig. Line	200	Refrigerator	80,000	40	0	St. Und'frame	56,000	February	April	Am. Car & Fdy.
	500	Refrigerator	80,000	40	0	St. Und'frame	57,000	March	July	Am. Car & Fdy.
	330	Refrigerator	60,000	36	0	St. Cent. Sills	45,000	March	August	Company Shops
Oliver Iron Mining Co.	10	Dump	.....	.....		All Steel	84,000	June	September	Differential
	40	Air Dump	30 cu. yd.	.....		.....	.....	March	.....	Magor
Ozan Graysonia Lbr.	3	Tank	10,000g.	28	0	All Steel	46,100	November	December	Am. Car & Fdy.
Pacific Fruit Express	1,000	Refrigerator	60,000	33	2¾	St. Und'frame	52,300	February	May-July	Am. Car & Fdy.
	1000	Refrigerator	60,000	33	2¾	St. Und'frame	52,650	February	June-Sept.	Gen. Amer. Car
	1000	Refrigerator	60,000	33	2¾	St. Und'frame	52,665	February	May-July	Pac. Car & Fdy
	1043	Refrigerator	60,000	33	2¾	St. Und'frame	53,600	February	June-July	Pullman
	1000	Refrigerator	60,000	33	2¾	St. Und'frame	53,300	February	May-July	Standard Steel
Palace Poultry Car Co.	100	Poultry	60,000	36	6	Steel Frame	35,400	September	November	Ill. Car & Mfg.
Pan Amer. Petroleum Co.	12	Tank	10,000g.	28	0	All Steel	55,000	February	April	Am. Car & Fdy.
Pennsylvania	600	D. S. Box	100,000	40	6	All Steel	48,200	April	November	Bethlehem Steel
	400	D. S. Box	100,000	40	6	All Steel	48,200	April	October	Pressed Steel
	500	D. S. Box	100,000	40	6	All Steel	48,200	April	September	Am. Car & Fdy.
	500	D. S. Box	100,000	40	6	All Steel	48,200	April	October	Ralston
	100	Cabin	.....	23	3½	All Steel	38,000	April	Mar., 1927	Company Shops
Pennsylvania-Ohio	10	D. S. Box	80,000	45	8	Steel Frame	42,800	January	May	J. G. Brill
Pennsylvania Oil Products	2	Tank	80,000	.....		All Steel	41,400	.....	August	Standard Tank
Penn. Salt Mfg. Co.	5	Tank	8,000g.	28	0	All Steel	42,000	November	December	Am. Car & Fdy.
	7	Tank	30,000	28	0	All Steel	30,100	November	December	Am. Car & Fdy.
Pennsylvania Tank Line	34	Tank	100,000	.....		All Steel	.....	November	Nov.-Dec.	Penn. Car
	1	Tank	80,000	.....		All Steel	.....	June	July	Penn. Car
	6	Tank	80,000	.....		All Steel	.....	August	September	Penn. Car
	10	Tank	80,000	.....		All Steel	.....	March	April	Penn. Car
	1	Tank	80,000	.....		All Steel	.....	March	April	Penn. Car
	11	3-Comp. Tank	80,000	.....		All Steel	.....	April	June	Penn. Car
	2	Tank	80,000	.....		All Steel	.....	April	May	Penn. Car

Purchaser	No.	Class	Capacity	Length Ft.	Length In.	Construction	Weight	Date of Order	Date of Delivery	Builder
Peoria & Eastern	50	S. C. Hopper	110,000	30	6⅜	All Steel	42,300	Oct., 1925	May, 1926	Ralston
Pere Marquette	25	Hopper	80,000	19	11	Steel	38,500	September	December	Pressed Steel
	10	Air Dump	30 cu. yd.	34	0	All Steel	70,150	April	July	Magor
Phil. Quartz Co.	2	Tank	7,000g.	28	0	All Steel	46,800	October	December	Am. Car & Fdy.
Phillips Petroleum Co.	100	Tank	80,000	40	0	All Steel	49,000	January	April	Standard Tank
	700	Tank	100,000	.....		All Steel	.....	November	Mar., 1927	Standard Tank
Pickands-Mather Co.	8	Dump	.....	34	0	All Steel	64,000	Dec., 1925	May, 1926	Differential
Pittsburgh Cruc. Steel Co.	5	Spec. Flat	.....	.....		.....	.....	August	.....	Standard Steel
Pitts. Gas Coal Co.	1	.....	.....	.....		Steel Frame	.....	November	December	Am. Car & Fdy.
Pittsburgh Steel Co.	6	Air Dump	30 cu. yd.	.....		.....	.....	September	.....	Koppel
Prescott & N. W.	2	Tank	10,000g.	28	0	All Steel	46,100	November	December	Am. Car & Fdy.
Pub. Serv. Co. of N. Ill.	3	Gondola	100,000	40	0	Steel Frame	.....	July	December	Am. Car & Fdy.
Quaker City Tank	100	Refrigerator	80,000	33	0	.....	.....	November	1927	Gen. Amer. Car
Robbins Bros.	2	Flat	60,000	33	0	All Wood	26,900	July	September	Mt. Vernon
Roxana Petro. Corporation	200	Tank	8,000g.	28	0	All Steel	40,700	January	May	Am. Car & Fdy.
	201	Tank	10,000g.	28	0	All Steel	44,300	January	April	Am. Car & Fdy.
St. Louis Ind. Packing Co.	10	Tank	8,000g.	28	0	All Steel	43,900	June	August	Am. Car & Fdy.
St. Louis-San Francisco	950	.....	.....	.....		.....	.....	.....	.....	Company Shops
St. Louis Southwestern	10	.....	.....	.....		.....	.....	.....	.....	Company Shops
Savannah & Atlanta	5	Dump	.....	34	0	All Steel	64,000	June	October	Differential
Seaboard Air Line	1,000	Box	80,000	40	6	Steel Frame	44,950	February	July-Sept.	Pressed Steel
	800	Gondola	100,000	40	6	Steel Frame	42,000	February	August	Standard Steel
	800	Gondola	100,000	41	6	Steel Frame	43,500	February	June-Aug.	Pressed Steel
	800	Gondola	100,000	41	5⅞	St. Und'frame	42,240	February	August	Am. Car & Fdy.
	50	Caboose	60,000	36	0	Steel Frame	42,900	April	October	Am. Car & Fdy.
Shippers' Car Line	75	Tank	10,000g.	28	0	All Steel	45,800	May	July	Am. Car & Fdy.
	3	Tank	10,000g.	28	0	All Steel	45,800	August	September	Am. Car & Fdy.
	50	Tank	10,000g.	28	0	All Steel	46,100	September	November	Am. Car & Fdy.
	50	Tank	10,000g.	28	0	All Steel	44,650	October	December	Am. Car & Fdy.
	50	Tank	10,000g.	28	0	All Steel	46,100	November	December	Am. Car & Fdy.
Sims, C. A., Const. Co.	6	Air Dump	30 cu. yd.	.....		.....	.....	September	.....	Koppel
Sinclair Refining	50	Tank	10,000g.	.....		All Steel	54,200	July	August	Gen. Amer. Tank
	16	Coke	.....	.....		.....	.....	September	.....	Koppel
Southern	1,500	D. S. Box	80,000	36	0	St. Cen. Sill	42,200	April	July-Sept.	Mt. Vernon
	1,000	Hopper	100,000	30	9	Steel Frame	41,300	April	June-Aug.	Penn. C.I.& R.R.
	250	Ballast	100,000	33	0	All Steel	47,500	April	Oct.-Nov.	Gen. American
	100	Caboose	.....	.....		.....	.....	March	.....	Company Shops
	500	Flat	.....	.....		.....	.....	March	.....	Company Shops
Southern Pacific	1,100	S. S. Box	.....	.....		St. Und'frame	100,000	.....	.....	Pullman
	500	D. B. Gond.	.....	.....		.....	100,000	.....		Pressed Steel
	350	Stock	.....	.....		.....	.....	.....	.....	Company Shops
	300	Flat	.....	.....		.....	.....	.....		Company Shops
	64	Caboose	.....	.....		.....	.....	.....	.....	Company Shops
Spencer Kellogg & Sons, Inc.	3	Tank	6,000g.	32	5⅞	All Steel	35,800	March	May	Am. Car & Fdy.
	2	Tank	6,000g.	32	5⅞	All Steel	36,100	March	May	Am. Car & Fdy.
Standard Oil Co. of N. J.	3	Dump	80,000	37	0	All Steel	50,640	July	October	Am. Car & Fdy.
Standard Slag Co.	7	Dump	30 cu. yd.	.....		.....	.....	October	.....	Clark Car Co.
Standard Steel Car Co.	3	Tank	10,000g.	.....		All Steel	.....	April	.....	Standard Tank
Standard Transit Co.	200	Tank	10,000g.	.....		All Steel	.....	November	.....	Standard Tank
	300	Tank	10,000g.	.....		All Steel	.....	November	.....	Standard Tank
Stauffer Chemical Co.	1	Tank	8,000g.	28	0	All Steel	41,300	January	February	Am. Car & Fdy.
	1	Tank	8,000g.	28	0	All Steel	41,200	January	February	Am. Car & Fdy.
Stroud, B. B.	10	Tank	40,000	28	0	All Steel	.....	April	.....	Am. Car & Fdy.
Tennessee Central	100	Gond.	100,000	40	6	All Steel	43,700	June	Oct.-Nov.	Pressed Steel
	100	Hopper	110,000	30	6	All Steel	41,500	June	Oct.-Nov.	Pressed Steel
	25	Flat	100,000	42	1½	All Steel	37,400	June	Oct.-Nov.	Pressed Steel
	50	Stock	80,000	38	0	Steel Frame	40,300	June	Oct.-Nov.	Pressed Steel
Tennessee Coal, Iron & R. R.	20	Hopper	140,000	38	8¾	All Steel	58,700	January	.....	Company Shops
	40	Ore	100,000	20	11¾	All Steel	39,400	January	.....	Company Shops
Texas & Pacific	300	Auto Box	.....	.....		.....	.....	May	.....	Am. Car & Fdy.
Tide Water Oil Co.	6	Dump	30 cu. yd.	34	0	Steel Frame	50,640	August	October	Am. Car & Fdy.
	4	Flat	80,000	.....		St. Und'frame	34,200	August	November	Am. Car & Fdy.
Tiona Refining Co.	10	Tank	8,000g.	28	0	All Steel	42,000	January	March	Am. Car & Fdy.
Texas Company	2	Tank	63,000	34	4	All Steel	51,000	March	June	Standard Steel
	6	Tank	61,000	34	4	All Steel	51,000	November	Jan., 1927	Standard Steel
Toledo Bowling Gr. & So. Trac. Co.	10	D. S. Box	80,000	45	8	Steel Frame	42,800	January	April	J. G. Brill
Toledo Terminal	5	.....	.....	.....		.....	.....	.....	.....	Company Shops
Tonopah & Tidwater	2	Ballast	100,000	33	1⅜	All Steel	45,700	February	April	Am. Car & Fdy.
Transcontinental Oil Co.	4	Compt. Tank	6,000g.	28	0	All Steel	44,000	January	April	Am. Car & Fdy.
Union Oil	2	Tank	100,000	36	11	All Steel	53,600	May	August	Gen. Am. Tank
	33	Tank	100,000	36	11	All Steel	57,800	May	September	Gen. Am. Tank
Union Pacific	500	Ballast	100,000	33	0	All Steel	48,300	January	June-July	Pullman
	500	Ballast	100,000	33	0	All Steel	46,100	January	June-July	Rodger Ballast
	700	Automobile	100,000	50	0	All Steel	60,500	January	Aug.-Sept.	Gen. Amer. Car
	300	Automobile	100,000	50	0	All Steel	60,400	January	Aug.-Nov.	Penn. Car
	20	Air Dump	100,000	.....		All Steel	58,400	March	March	Clark Car Co.
	30	Flat	.....	.....		.....	.....	September	.....	Company Shops
Union Reduction Co.	2	Rack	80,000	43	0	St. Und'frame	.....	January	April	Am. Car & Fdy.
Union Refrig. Transit Co.	100	Refrigerator	80,000	40	0	Steel Frame	58,000	Dec., 1925	1926	Company Shops
	100	Refrigerator	80,000	40	0	Steel Frame	58,000	Sept., 1925	1926	Company Shops
Union Traction Co. Ind.	7	Box	80,000	48	0	St. Und'frame	34,100	August	November	Am. Car & Fdy.
United Alloy Steel Corp.	15	.....	.....	.....		.....	.....	January	.....	Canton Car Co.
U. S. Cast I. P. & Fdy.	6	Gondola	140,000	.....		All Steel	49,000	November	January	Am. Car & Fdy.
U. S. Army Air Service	1	Helium Tank	140,000	41	1¼	All Steel	.....	July	1927	Bethlehem Steel
U. S. Govt.-Navy Dept.	1	Hopper	50,000	22	7	All Steel	24,200	August	November	Am. Car & Fdy.
Virginia Smelting Co.	3	Tank	30,000	42	3	All Steel	30,100	February	April	Am. Car & Fdy.
Wabash	40	Caboose	60,000	29	4½	St. Und'frame	41,500	August	1926-1927	Company Shops
	1	Caboose	60,000	31	2¾	St. Und'frame	39,200	February	May	Company Shops
	15	Auto Box	80,000	40	6	St. Und'frame	46,200	January	May	Am. Car & Fdy.
Walton Construction Co.	18	Air Dump	.....	.....		.....	.....	September	.....	Koppel
Waugh, Henry, Bluefield, W. Va.	10	Air Dump	.....	.....		.....	.....	January	.....	Pressed Steel
Waukegan Generating Co.	3	Gondola	100,000	40	0	All Steel	40,500	August	December	Am. Car & Fdy.
Waverly Oil Works	20	Tank	10,000g.	28	0	All Steel	46,200	May	July	Am. Car & Fdy.
Weatherford Min. Wells & No. West	300	Automobile	100,000	50	6	St. Und'frame	58,400	May	October	Am. Car & Fdy.
Western Fruit Express	34	Refrigerator	80,000	33	2¾	St. Und'frame	54,000	November	1926	Company Shops
Western Ohio	10	D. S. Box	80,000	45	8	Steel Frame	42,800	January	June	J. G. Brill

Purchaser	No.	Class	Capacity	Length Ft.	Length In.	Construction	Weight	Date of Order	Date of Delivery	Builder
Western Maryland	500	Hopper	100,000	30	6	All Steel	.....	November	Feb., 1927	Bethlehem Steel
Western Pacific	8	Caboose	60,000	29	2½	St. Und'frame	34,500	March	August	Company Shops
Westmoreland Coal Co.	10	Hopper	100,000	.....		All Steel	43,300	February	Sept.-Oct.	Bethlehem Steel
West Penn Cement Company	3	Air Dump	.....	.....		.....	.....	May	.....	Koppel
West Virginia Midland	2	Gondola	30,000	28	0	Wood Frame	12,000	.....	1926	Company Shops
	2	.....	.....	.....		.....	.....	.....	.....	Company Shops
Various Purchasers names not supplied	106	Logging trucks	.....	.....		.....	.....	.....	.....	Pac. Car & Fdy.
	202	Skeleton Flats	.....	.....		.....	.....	.....	.....	Pac. Car & Fdy.
	12	Flats	.....	.....		.....	.....	.....	.....	Pac. Car & Fdy.
	27	Special	.....	.....		.....	.....	.....	.....	Pac. Car & Fdy.
	9	Ballast	.....	.....		.....	.....	.....	.....	Pac. Car & Fdy.

Canada

Purchaser	No.	Class	Capacity	Length Ft.	Length In.	Construction	Weight	Date of Order	Date of Delivery	Builder
Canadian National	30	Air Dump	30 cu. yd.	34	0	All Steel	68,900	April	July	Nat'l Steel Car
	60	.....	80,000	.....		.....	.....	May	.....	Eastern Car
	40	Tank	10,000g.	.....		.....	.....	May	.....	Can. Car & Fdy.
Canadian Pacific	375	Coal	152,000	41	6	Steel Frame	58,800	February	May	Can. Car & Fdy.
	315	Frt. Refg.	70,000	39	11	St. Und'frame	65,400	February	September	Nat'l Steel Car
	235	Flat	100,000	.....		Steel	34,600	February	May	Eastern Car
	75	Flat	100,000	.....		Steel	34,600	June	August	Eastern Car
Morrow & Beatty	15	Dump	6 cu. yd.	11	0	Wood & Steel	.....	November	Jan., 1927	Nat'l Steel Car
Pere Marquette	350	S. S. Box	80,000	42	6	All Steel	45,000	April	October	National Steel

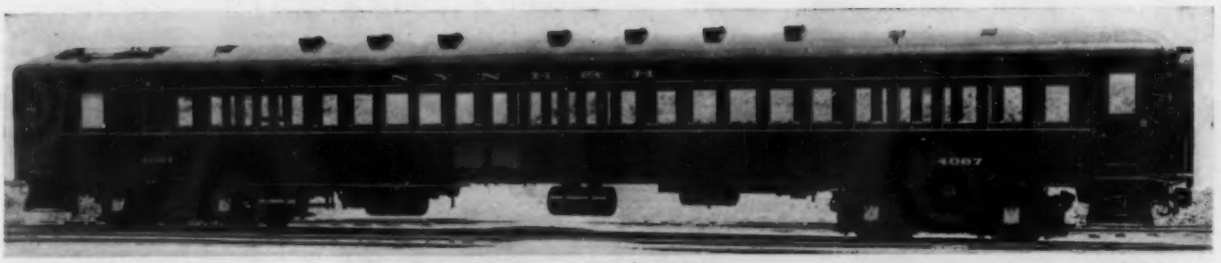
Mexico

Mexican Railway	43	.....	.....	.....		.....	.....	.....	.....	Company Shops

Export

Purchaser	No.	Class	Capacity	Length Ft.	Length In.	Construction	Weight	Date of Order	Date of Delivery	Builder
Amaga	10	S. S. Box	44,000	35	0	St. Und'frame	25,000	May	October	Standard Steel
Anglo Chilean Consol. Nitrate Corp.	62	Gord. Ore	60,000	20	0	All Steel	33,380	April	June	Koppel
Brazilian Portland Cement Co.	10	Dump	.....	.....		.....	.....	March	.....	Magor
Central of Brazil	200	S. S. Box	90,000	35	11	St. Und'frame	40,000	February	July	Standard Steel
	100	Gondola	90,000	41	2	All Steel	38,900	February	July	Standard Steel
	100	Gondola	50,000	35	8	All Steel	25,000	February	August	Standard Steel
	50	S. S. Box	50,000	35	8	St. Und'frame	25,300	February	August	Standard Steel
	50	Flat	50,000	35	8	St. Und'frame	19,000	February	August	Standard Steel
Central Ry. of Brazil	150	Hopper	90,000	31	11	All Steel	42,000	November	Feb., 1927	Standard Steel
	50	Hopper	50,000	30	2	All Steel	27,600	November	Feb., 1927	Standard Steel
Chateaugay Ore & I.	5	Gondola	140,000	38	0	All Steel	.....	September	Jan., 1927	Am. Car & Fdy.
Paulista	150	S. S. Box	88,000	37	3	All Steel	39,000	January	September	Standard Steel
	220	Gondola	88,000	37	3	St. Und'frame	35,000	January	September	Standard Steel
	50	Flat	88,000	46	11	St. Und'frame	55,000	January	September	Standard Steel
South Porto Rico Sugar Co.	80	Cane	60,000	.....		.....	.....	May	.....	Magor
Cuban-American Sugar Co.	100	Cane	30,000	.....		.....	.....	August	.....	Gregg
International Rys. of Central Amer.	152	Flat	40,000	.....		St. Und'frame	.....	.....	.....	Magor
	10	Tank	.....	.....		All Steel	.....	.....	.....	Magor
	250	Box	50,000	.....		St. Und'frame	.....	.....	.....	Gregg
Manati Sugar Co.	50	.....	.....	.....		.....	.....	January	.....	Am. Car. & Fdy.
Manilla Railroad	50	Flat	.....	.....		.....	.....	October	.....	Koppel
South African	20	Gondola	.....	.....		.....	.....	May	.....	Standard Steel
Tela	50	Banana	40,000	.....		.....	.....	January	.....	Magor
Viscose Co.	2	Hopper	140,000	.....		All Steel	.....	August	August	Standard Steel

The Bober Viaduct on the Berlin-Hirschburg Line in Germany



Multiple Unit Trailer Coach Built for the New York, New Haven & Hartford by the Osgood Bradley Car Company

Passenger Car Orders in 1926

Figures show buying to have been irregular and slow

By F. W. Kraeger
Associate Editor, *Railway Age*

ORDERS placed in 1926 for passenger train cars for service in the United States totaled 1,868. This compared with 2,191 in 1925 and 2,554 in 1924; with 2,214 in 1923 and with 2,382 in 1922. The totals given do not include the increasingly popular rail-motor cars, details concerning the orders for which are contained in a separate article.

Railways in Canada reported orders for 236 passenger train cars, the largest number since 1923 when 263 were ordered.

Passenger train cars built for domestic service in the United States totaled 2,184 as compared with 2,363 in 1925.

Table I—The Passenger Car Orders of 1926

For service in the United States	1,868
For service in Canada	236
For export to other countries	58
Grand total	2,162

Table II—Orders for Passenger Cars Since 1901

Domestic Orders Only

Year	Passenger cars	Year	Passenger cars
1901	2,379	1909	4,514
1902	3,459	1910	3,881
1903	2,310	1911	2,623
1904	2,213	1912	3,642
1905	3,289	1913	3,124
1906	3,403	1914	1,674
1907	1,791	1915	1,978
1908	1,319		

Domestic and Foreign

Year	Domestic	Canadian	Export	Total
1916	2,302	...	109	2,411
1917	1,124	...	43	1,167
1918	9	22	26	57
1919	292	347	143	782
1920	1,781	275	38	2,094
1921	246	91	155	492
1922	2,382	87	19	2,488
1923	2,214	263	6	2,483
1924	2,554	100	25	2,679
1925	2,191	50	76	2,317
1926	1,868	236	58	2,162

Table III—Passenger Cars Built in 1926

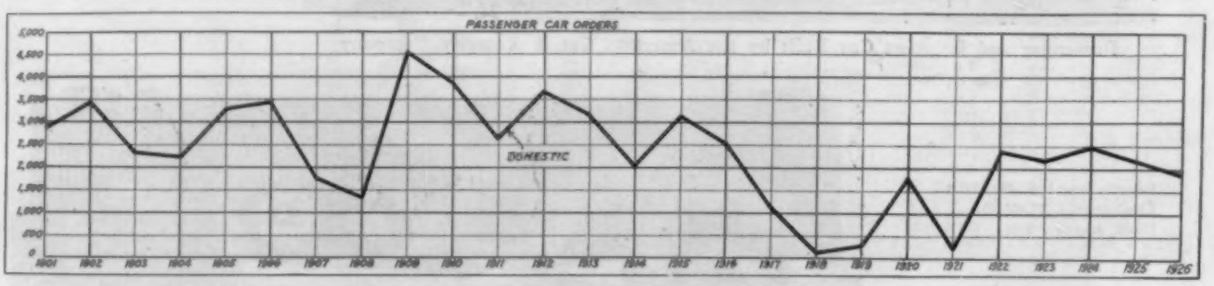
	United States	Canada	Total
Domestic	2,184	285	2,469
Foreign	102	...	102
	2,286	285	2,571

Comparison with Previous Years

Year	Passenger Domestic	Passenger Foreign	Passenger Total
1899	1,201	104	1,305
1900	1,515	121	1,636
1901	1,949	106	2,055
1902	From 1902 to 1907		1,948
1903	passenger car figures		2,007
1904	in these two columns		2,144
1905*	included in corre-		2,551
1906*	sponding freight car		3,167
1907*	columns.		5,457
1908*	1,645	71	1,716
1909*	2,698	151	2,849
1910*	4,136	276	4,412
1911*	3,938	308	4,246
1912†	2,822	238	3,060

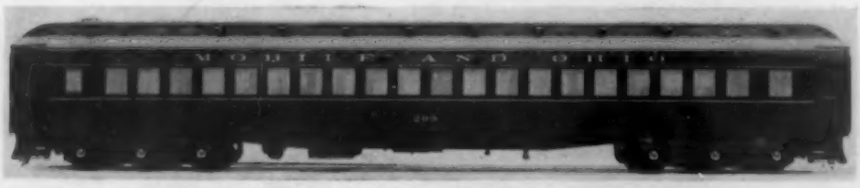
*Includes Canadian output.
†Includes Canadian output and equipment built in company shops.

Year	United States Domestic	United States Foreign	United States Total	Canadian Domestic	Canadian Foreign	Canadian Total	Grand total
1913	2,559	220	2,779	517	...	517	3,296
1914	3,310	56	3,366	325	...	325	3,691
1915	1,852	14	1,866	83	...	83	1,949
1916	1,732	70	1,802	37	...	37	1,839
1917	1,924	31	1,955	45	...	45	2,000
1918	1,480	92	1,572	1	...	1	1,503
1919	306	85	391	160	...	160	551
1920	1,272	168	1,440	...	...	...	....
1921	1,275	39	1,314	361	...	361	1,675
1922	676	144	820	71	...	71	891
1923	1,507	29	1,536	...	...	...	....
1924	2,150	63	2,213	167	...	167	2,380
1925	2,363	50	2,413	...	...	...	....
1926	2,184	102	2,286	285	...	285	2,571



Passenger Car Orders, 1901 to 1926

Seating capacity, 83
Length over end sills, 69 ft.
Total weight, 141,000 lb.
Built, July, 1926.



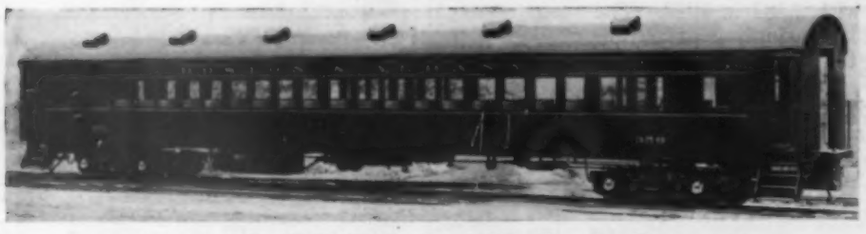
Day Coach Built by the American Car & Foundry Company

Length over end sills, 76 ft. 5⅝ in.
Total weight, 151,700 lb.
Built-up steel underframe
Built, October, 1926

Observation Car Built by the Pullman Car & Manufacturing Corporation

Length over end sills, 79 ft. 1 in.
Total weight, 148,300 lb.
Built, July, 1926

Baggage and Express Car Built by the National Steel Car Corporation, Ltd.

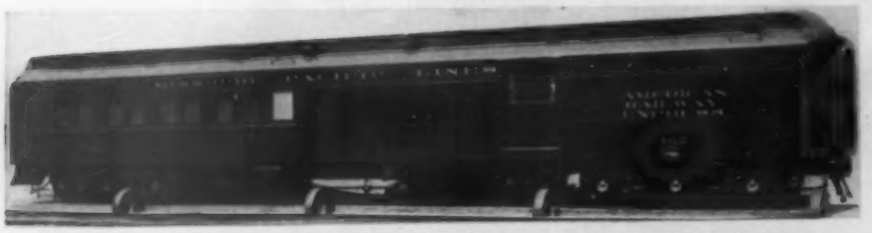


Seating capacity, 100
Length over end sills, 73 ft. 11½ in.
Total weight, 101,500 lb.
Built, February, 1926

Suburban Car Built by the Osgood Bradley Car Company

Length over end sills, 74 ft. 1⅝ in.
Total weight, 140,000 lb.
Built, February, 1926

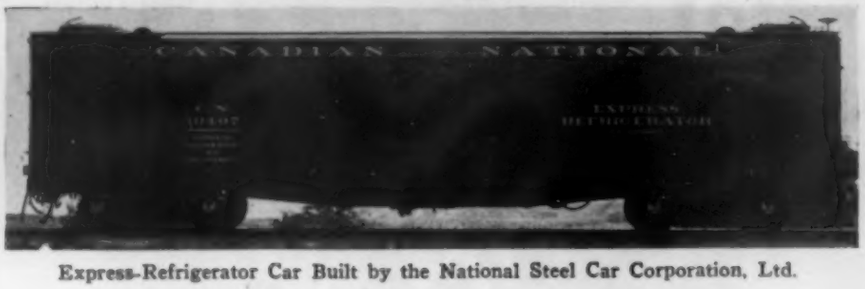
Baggage and Mail Car Built by the Pressed Steel Car Company



Seating capacity, 32
Length over end sills, 70 ft.
Total weight, 141,000 lb.
Built, July, 1926

Passenger and Baggage Car Built by the American Car & Foundry Company

Length over end sills, 50 ft.
Total weight, 85,000 lb.
Built, August, 1926



Express-Refrigerator Car Built by the National Steel Car Corporation, Ltd.

Orders for export dropped to 58 cars in 1926, as against 76 in 1925. The total was, however, higher than 1922, 1923 and 1924.

The buying of passenger cars was ragged throughout the year. January saw 217 ordered and April, 230, and then followed a drop to 30 in May. There were 124 bought in June and only one in August. The number increased after that, but the figure never reached 200 for any of the later months of the year. The behavior of the market was in contrast to that in 1925 when there was a small amount of business in January, an increase by August and a peak reached in December. The railroads are continuing to improve their passenger service. As in 1925, they have worked to increase the long-haul business to balance losses in short-haul traffic. However, passenger traffic, on the whole, decreased in the first nine months of the year, according to reports to the Interstate Commerce Commission. It may be that realization of the decrease in the later part of the year accounts for the failure of buying to recover to a greater extent at the end of 1926.

Orders for passenger cars in 1926, while slightly less, did not vary from the normal pre-war years, nor from the good years following the war to the extent that orders for other classes of equipment did. Tinged as it was with a slight depression, the tendency of passenger car buying to hold up is doubtless due, in a great measure, as was pointed out above, to the efforts of the railroads to improve through service and to make limited trains as attractive to traffic as possible with the installation of new equipment of modern design and luxurious conveniences.

As in 1925, the largest single order for passenger train equipment was placed by the Pennsylvania when in April it distributed orders for 209 cars. The Pennsylvania's passenger car orders for the year totaled over 260. The New York Central System placed the year's second largest order with a total of 124 cars. The New York Central System was in the market at various times during the year, and the total of passenger train car orders placed for all of its roads was over 170 cars.

The lists of orders which follow are compiled in the usual manner, returns from the railroad being checked with and amplified from lists of orders furnished by the builders, largely through the co-operation of the American Railway Car Institute, and from the weekly reports of orders in the Equipment and Supplies column of the *Railway Age*. The lists appear in slightly different form from last year. Construction is assumed to be all-steel, but exceptions are noted. Additional information presented for the first time this year includes dates of order and delivery, when possible.

Passenger Car Orders in 1926

For Service in the United States

Purchaser	No.	Class	Length Ft.	Length In.	Seating Capacity	Weight	Date of Order	Date of Delivery	Builder
Atchison, Topeka & Santa Fe									
	9	Lounge	83	7⅛	48	175,700	August	Nov.-Dec.	Pullman
	9	Dining	83	4⅛	42	172,000	August	Nov.-Dec.	Pullman
	5	Dining	83	4⅛	42	173,000	August	Nov.-Dec.	Pullman
Baltimore & Ohio	3	Postal	63	7¾	..	135,000	January	September	Am. Car & Fdy.
	5	Mail Comp.	73	7	.	138,500	January	September	Am. Car & Fdy.
	10	Horse	76	4	..	141,000	January	August	Am. Car & Fdy.
	15	Baggage	73	7	..	133,000	January	Jan. 1927	Bethlehem Ship
	25	Coaches	79	5	80	151,100	January	September	Pullman
	15	Comb.	76	2	48	144,800	January	September	Pullman
Boston & Albany	10	Coaches	78	6	88	132,000	September	Feb. 1927	Pullman
	2	Pass. & Bagg.	78	6	48	144,000	September	Feb. 1927	Am. Car & Fdy.
	10	Baggage	60	6	..	111,000	September	Jan. 1927	Am. Car & Fdy.
Central of Georgia	5	Coaches	78	11½	82	138,800	March	Nov.-Dec.	Pullman
	1	Coaches	78	11¾	78	139,100	March	Nov.-Dec.	Pullman
Central of New Jersey	25	Coaches	72	5½	78	115,900	February	Jan. 1927	Bethlehem Ship
	5	Comb.	72	5½	51	119,000	February	September	Pressed Steel
	5	Baggage	74	5½	..	143,500	February	August	Am. Car & Fdy.
Chicago & Eastern Illinois	2	Dining	80	1½	36	173,200	February	October	Pullman
Chicago & North Western	8	Baggage	72	1½	..	.....	November	May 1927	Pullman
	4	Dining	82	8¾	..	.....	September	May 1927	Pullman
	3	Pass. & Bagg.	70	0	54	136,700	November	June 1927	Am. Car & Fdy.
	2	Bagg. & Dorm.	70	0	..	120,300	September	Jan. 1927	Am. Car & Fdy.
Chicago, North Shore & Milwaukee	23	.....	.....		..	.....	.....	.....	Cincinnati Car Co.
Chicago, Burlington & Quincy	25	Subur. Coach	79	11½	100	91,800	January	June-Dec.	Company Shops
Chic., Rock Island & Pacific	5	Baggage	70	0	..	132,300	March	September	Am. Car & Fdy.
Cinn., New Orleans & Tex. Pac.	5	Coaches	75	9½	83	137,500	April	September	Pullman
Delaware, Lackawanna & Western	40*	Milk	45	5¼	..	84,000	January	April-May	Standard Steel
	2	Mail & Bagg.	74	1	54	116,000	June	November	Am. Car & Fdy.
	2	Dining	81	0	36	160,000	January	December	Pullman
Denver & Rio Grande Western	4	Dining	.....		..	.....	December	1927	Am. Car & Fdy.
Donohue, James P.	1	Private	73	6	..	182,700	January	October	Am. Car & Fdy.
Erie	15	Coaches	78	8	84	141,500	June	December	Standard Steel
Florida East Coast	8	Baggage	70	0	..	134,500	February	July	Pullman
	2	Dining	82	0¼	36	167,200	February	November	Pullman
	2	Mail	60	10½	..	132,300	February	November	Pullman
Ft. Worth & Denver City	4*	Baggage	76	10⅛	..	135,300	March	May	Grt. Nor. Shops
	6*	Coach	76	10⅛	84	140,600	March	March	Grt. Nor. Shops
Georgia	1	Mail & Bagg.	64	1½	..	121,300	January	October	Company Shops
Gulf, Mobile & Northern	2	Bagg. & Mail	73	9½	..	136,000	April	November	Am. Car & Fdy.
Hutton, E. F.	1	Baggage	63	3¼	..	116,540	January	July	Am. Car & Fdy.
Illinois Central	3	Dining	73	6	36	160,000	March	December	Pullman
	5	Baggage	70	9	..	135,300	March	Aug.-Sept.	Am. Car & Fdy.
	6	Coaches	.....		..	.....	March	.....	Am. Car & Fdy.
Long Island	20	Coaches	63	4¾	76	79,000	November	May 1927	Am. Car & Fdy.
	4	Pass. & Bagg.	63	4¾	54	97,800	November	May 1927	Am. Car & Fdy.
	60	M. O. Coaches	.....		..	.....	November	.....	Am. Car & Fdy.
	30	Trailers	.....		..	.....	November	.....	Am. Car & Fdy.
Los Angeles & Salt Lake	5	Observation	82	11½	..	150,000	January	October	Pullman
	5	Coaches	79	3	81	145,000	January	August	Pullman
	4	Baggage	72	5⅜	..	122,000	January	June	Am. Car & Fdy.
	2	Bagg. & Post	72	5⅜	..	128,000	January	August	Am. Car & Fdy.
Louisville & Nashville	3	Bagg. & Mail	74	9½	..	140,700	June	December	Am. Car & Fdy.
	12	Bagg. & Mail	72	9½	..	140,000	June	December	Am. Car & Fdy.
	12	Baggage	72	9½	..	135,000	June	December	Pressed Steel
	2	Postal	62	10½	..	130,300	November	April 1927	Am. Car & Fdy.
	2	Bagg. & Mail	74	4½	36	140,100	November	April 1927	Am. Car & Fdy.
	10	Comp. Coaches	77	9½	80	145,500	November	April 1927	Am. Car & Fdy.
	6	Comp. Coaches	77	9¾	80	145,700	November	April 1927	Am. Car & Fdy.

* Steel underframe.

Purchaser	No.	Class	Length Ft.	Length In.	Seating Capacity	Weight	Date of Order	Date of Delivery	Builder
	6	Coaches	77	9¾	82	144,600	November	April 1927	Am. Car & Fdy.
	2	Dining	80	0	..	111,500	October	April 1927	Am. Car & Fdy.
Michigan Central	10	Coaches	78	7¾	85	131,900	September	Feb. 1927	Pullman
	10	Baggage	72	10	..	136,900	September	Jan. 1927	Am. Car & Fdy.
Minn., St. Paul & S. S. Marie	2	Cafe-Par	83	4½	18	166,200	January	September	Pullman
Missouri Pacific	18	.....	.....		..	.....	January	.....	Am. Car & Fdy.
Mobile & Ohio	10	.....	.....		..	.....	January	.....	Am. Car & Fdy.
Nashville, Chatt. & St. Louis	4	Baggage	71	0	..	128,400	March	August	Am. Car & Fdy.
New York Central	10	M. U. Coaches	69	4½	100	131,400	March	November	Standard Steel
	10	Coaches	77	9¾	85	127,400	September	Jan. 1927	Pullman
	3	Pass. & Bagg.	74	11¾	48	128,000	September	Feb. 1927	Am. Car & Fdy.
	30	Sub. Coaches	78	1¾	96	105,000	September	Feb. 1927	Osgood-Bradley
	2	Sub. Pass. & Bagg.	75	3¾	68	103,000	September	Mar. 1927	Osgood-Bradley
	2	Sub. P. B. & M.	75	3¾	38	104,000	September	Mar. 1927	Osgood-Bradley
	20*	Milk	52	3¾	..	84,000	September	Jan. 1927	Merchants Dispatch
New York, Chicago & St. Louis	2	Dining	77	4¾	30	155,000	November	May 1927	Pullman
Norfolk & Western	3	Dining	.....		..	.....	December	1927	Pullman
N. Y., N. H. & Hartford	12	M. U. Motor	79	7¼	121	175,500	January	November	Osgood-Bradley
	15	M. U. Trailer	79	7¼	121	104,000	January	November	Osgood-Bradley
N. Y., Westchester & Boston	20	M. U. Coaches	72	0¾	88	126,900	April	1926-27	Pressed Steel
Oregon Short Line	5	Coaches	79	3	81	145,000	January	August	Pullman
	3	Baggage	72	5⅜	..	122,000	January	June	Am. Car & Fdy.
Oregon-Washington R. R. & Navi	3	Baggage	72	5⅜	..	122,000	January	June	Am. Car & Fdy.
Pennsylvania	24	Dining	82	0	36	167,000	June	.....	Company Shops
	35	Coaches	80	0	80	131,600	April	.....	Pressed Steel
	22	Coaches	80	0	80	131,600	April	.....	Standard Steel
	17	Coaches	80	0	80	131,600	April	.....	Pullman
	8	Cafe Coaches	80	0	56	135,000	April	.....	Pullman
	7	Pass. & Bagg.	77	0	40	140,000	April	.....	Pullman
	20	Elec. Coaches	64	0	72	123,000	April	.....	Standard Steel
	100	Bagg. Exp.	63	0	..	88,000	April	.....	Am. Car & Fdy.
	25	Bagg. Exp.	63	0	..	86,000	June	.....	St. Louis Car
	30	M. U. Coaches	54	0	..	.....	December	.....	Standard Steel
	15	M. U. Coaches	54	0	..	.....	December	.....	Pressed Steel
	15	M. U. Coaches	54	0	..	.....	December	.....	Am. Car & Fdy.
Pittsburgh & Lake Erie	10	Coaches	77	10	83	130,000	September	Feb. 1927	Am. Car & Fdy.
	5	Mail & Bagg.	61	4	..	116,500	September	Feb. 1927	Am. Car & Fdy.
Pullman Company	408	Gen'l. Sleeping	.....		..	.....	.....	.....	Pullman
	37	Parl. Obs. & Obs.	.....		..	.....	.....	.....	Pullman
	5	Private	.....		..	.....	.....	.....	Pullman
	1	Dining	.....		..	.....	.....	.....	Pullman
	29	Bagg. & Library	.....		..	.....	.....	.....	Pullman
	1	Bagg.-Kitchen	.....		..	.....	.....	.....	Pullman
Reading	25	Coaches	72	5½	77	114,000	May	Mar. 1927	Bethlehem Ship
	5	Comb.	72	5½	50	114,000	May	Mar. 1927	Bethlehem Ship
	4	Cafe	83	5½	32	150,000	June	Jan. 1927	Pullman
Richmond Fredericksburg & Potomac	6	Express	70	0	..	133,200	March	September	Am. Car & Fdy.
	1	Dining	.....		..	.....	August	.....	Pullman
	4	Coaches	83	7	88	140,000	March	November	Bethlehem Ship
Seaboard Air Line	15	Horse Exp.	74	0	..	133,900	June	December	Am. Car & Fdy.
	6	Pass. & Bagg.	73	10½	50	140,800	April	December	Am. Car & Fdy.
	20	Coach	72	0	90	145,000	June	December	Am. Car & Fdy.
	32	Express	60	8⅜	..	110,000	June	December	Pullman
	7	Diners	79	5	36	156,000	June	December	Pullman
Southern	25	Coaches	73	9¼	83	137,500	April	Aug.-Sept.	Pullman
	15	Bagg. Exp.	63	0	..	111,000	April	Aug.-Sept.	Pullman
	6	Bagg.	63	0	..	115,000	April	September	Pullman
	4	Postal	63	0	..	117,500	April	September	Pullman
	25	Refrigerator	.....		..	.....	March	.....	Company Shops
Southern Pacific	10	Coaches	72	0	..	.....	.....	.....	Pullman
	28	Baggage	70	0	..	.....	.....	.....	Pullman
	6	Bagg. & Post.	70	0	..	.....	.....	.....	Standard Steel
	11	Dining	77	0	..	.....	.....	.....	Pullman
Southern Pacific (La. & Tex. Lines)	1	Business	83	7	..	185,700	Dec. 1925	.....	Pullman
St. Louis-San Francisco	2	Baggage	.....		..	.....	.....	.....	Company Shops
Tennessee Central	1	Baggage	69	9	..	103,000	January	January	Hotchkiss Blue
	2	Baggage	65	4	..	102,350	June	June	Am. Car & Fdy.
Union Pacific	5	Observation	82	11½	..	156,000	January	October	Pullman
	8	Observation	.....		..	.....	December	1927	Pullman
	5	Dining	83	11½	36	162,000	January	September	Pullman
	10	Dining	.....		..	.....	December	1927	Pullman
	5	Coaches	79	3	81	145,000	January	September	Pullman
	5	Horse, Bagg., Auto	77	7½	..	135,400	January	July	Am. Car & Fdy.
	7	Bagg. & Dorm.	72	5⅜	..	130,000	September	Mar. 1927	Am. Car & Fdy.
	2	Bagg. & Mail	.....		..	.....	November	.....	Am. Car & Fdy.
	5	Horse, Bagg., Auto	.....		..	.....	November	.....	Bethlehem
	10	Baggage	72	5	..	.....	November	.....	Standard Steel
Washington, Baltimore & Annapolis	10	Art. M. U. Motor	97	4	94	118,000	August	Feb. 1927	J. G. Brill
	2	Bagg. & Mail	69	0	..	128,200	November	May 1927	Am. Car & Fdy.

Canada

Canadian National	50*	Exp. Refr.	50	0	..	85,800	April	August	National Steel
	7	.....	43	6	..	.....	August	December	National Steel
Canadian Pacific	11	Obs. Sleeping	70	11¾	26	174,000	February	June	Can. C. & Fdy.-Co. Sh.
	9	Compt.	75	6	40	178,000	February	August	Can. C. & Fdy.-Co. Sh.
	54	Sleeping	75	6	57	174,000	February	August	Can. C. & Fdy.-Co. Sh.
	8	Buf. Parlor	78	0½	36	173,000	February	August	Nat'l Steel & Co. Sh.
	24	1st Cl. Coaches	75	6	88	160,000	February	August	Nat'l Steel & Co. Sh.
	10	Tourist	75	6	60	178,000	February	September	Nat'l Steel
	11	Baggage	79	1	..	148,300	February	July	Nat'l Steel
	1	Official	74	6	..	188,400	February	August	Company Shops
	1	Official	74	6	..	.....	October	.....	Company Shops
	50*	Exp. Retg.	45	0	..	88,400	February	June	Can. Car & Fdy.

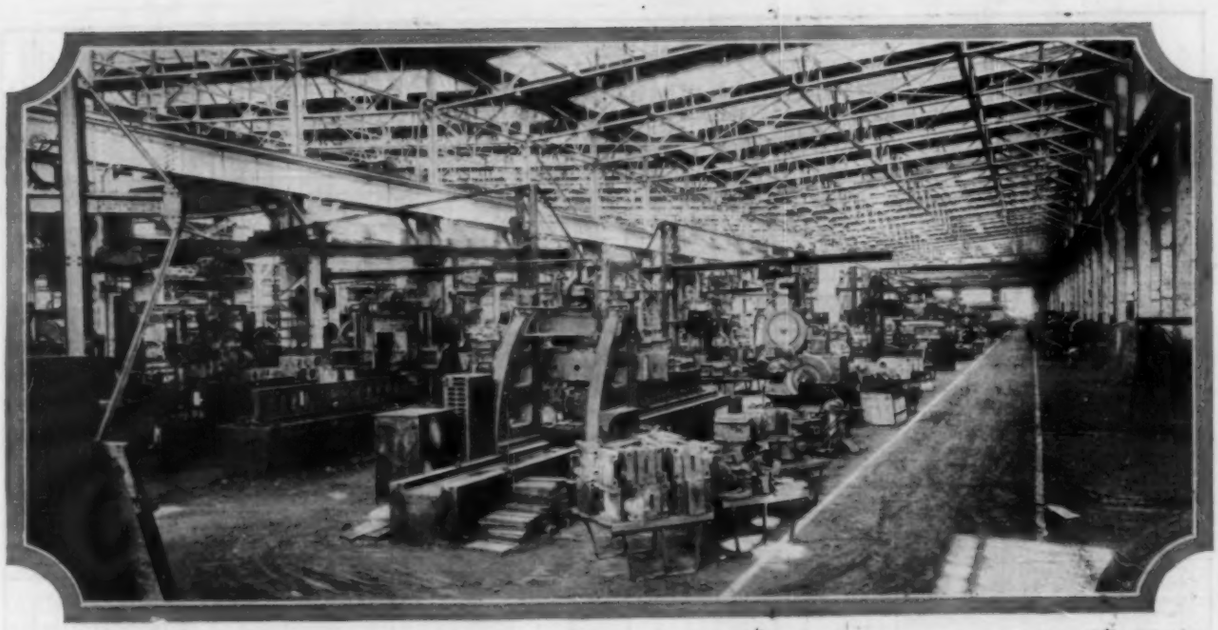
Mexico

Mexican Railway	2	.....	.....		..	.....	.....	.....	Company Shops

Export

Inter. Rys. of Cen. Am.	16*	1st Cl. Coaches	.....		..	.....	.....	.....	Am. Car & Fdy.
	17*	2nd Cl. Coaches	.....		..	.....	.....	.....	Am. Car & Fdy.
	6*	Baggage	.....		..	.....	.....	.....	Am. Car & Fdy.
	2	Chair	.....		..	.....	.....	.....	Wason Mfg. Co.
Manilla	12	.....	.....		..	.....	.....	.....	Am. Car & Fdy.
Quebec Central	1*	Coaches	70	0	78	114,800	February	June	Hotchkiss Blue
	1*	Coaches	70	0	84	.....	February	May	Hotchkiss Blue
	1*	Pass. & Bagg.	56	0	48	108,500	February	March	Hotchkiss Blue
	1*	Bagg. & Mail	78	9½	..	128,000	February	March	Hotchkiss Blue
	1*	Bagg. & Mail	76	9¼	..	127,600	February	May	Hotchkiss Blue

*Steel underframe.



Machine Tools Ordered During 1926

Substantial increase in the amount of shop equipment ordered last year as compared with 1925

By L. R. Gurley
Associate Editor, *Railway Age*

TWO years ago for the first time, a tabulation of machine tools ordered by the railroads in North America was published in the Annual Statistical Number of the *Railway Age*. In the tables were listed 1,658 units of equipment ordered by 85 railroads, representing 77 per cent of the total route mileage of this continent. The tabulation was published again in the first issue of last year's *Railway Age*. However, the list of the various types of machine tools and equipment purchased was enlarged to include blacksmith, boiler and car metal working or forming machines, car shop woodworking machines, material handling equipment—such as shop trucks, overhead cranes, car and locomotive hoists and small shop hoists,—furnaces, motors, air compressors and welding equipment.

In the tables for 1925 were listed 2,594 units of equipment which represented the orders of 88 railroads on this continent and 77 per cent of the total route mileage. The tables, shown again this year, contain the lists of machine tools and shop equipment furnished by 97 railroads in the United States and Canada which represent 84 per cent of the total route mileage. A total of 3,457 units are listed which is an increase of 863 over the number shown for 1925.

Twenty-four of the 88 railroads in the 1925 list do not appear in the 1926 list as they reported no orders during the year. However, these roads have been replaced by 28 railroads which ordered new equipment in 1926, but not in 1925, or an increase of four over the number of roads in the 1925 list. In many cases railroads reported substantial purchases of shop equipment but no car or locomotive purchases.

Many railroads which during the past few years have been relatively heavy purchasers of new cars and locomotives, have also been ordering a large amount of shop machinery and equipment. This indicates a realization of the economies that can be effected in the maintenance of motive power and rolling stock by the utilization of modern shop facilities.

Modern Machine Tools Are Required at Engine Terminals

Comparison of Types Purchased

The data available for three years indicates some interesting trends in the types of machine tools purchased

Purchaser	Lathes				Drill Presses		Planers	Shapers	Slotters	Boring Mills		Milling Machines		Grinding Machines				Metal Cutting Saws	Portable Boring, Facing and Turning Machines	Bolt Cutters and Threaders	Pipe Cutters and Threaders	Presses		Hammers		Forging Machines		Bulldozers	Punches	Shears	Combination Punch and Shear
	Axle	Engine	Turret	Wheel	Radial	Vertical and Others				Horizontal	Vertical and others	Universal	Horizontal and others	Cylindrical	Internal	Surface	Double End and others					Wheel	Others	Steam	Other Power	Bulldozers	Others			
Akron, Canton & Youngstown																	1													
Alabama Great Southern		6	1	1	1	2	1	1			2	1		1			3			2	1		1						1
Ann Arbor																				1									
Atchison, Topeka & Santa Fe		5		4	1	4		1			1		3		1		15	1	1	3	2		1	2				2	1
Atlantic City						1											1													
Atlantic Coast Line	2	26	5	3	5	16	2	3		1	7	1	1	1	1		17	3	7	3	1	2	3	4	2			1	5	1
Baltimore & Ohio	2	3	3	1	3	3	1	2	1		3	2	3	3		1	11	2	14	4	2			1	1		1	1	2	1
Bangor & Aroostook																													1	
Boston & Albany	1	9	1		1	3	1		1	2	2		2			2			2	1			1	2	1					
Bessemer & Lake Erie																														
Boston & Maine	2	1				1		3			2					1	1	1		1	1			2	1			1		1
Canadian National										No Report Received																				
Canadian Pacific	2		1		2	3	1	1					3			1	1	2		1	2		1	1						
Central of Georgia		3	2		2						1	1	1	1			5	3	1	1										
Central New England																							1							
Central of New Jersey	1																2		2		1									
Charleston & Western Carolina											1											1		1						
Chesapeake & Ohio	5	1						3			1			1	1	1	1	1	4			1		1	1		1			
Chicago, Burlington & Quincy		3				1	1	1									14	3	4						1	1		1	3	1
Chicago & Eastern Illinois	1																													
Chicago Great Western					2	4	1										1		1		1								1	
Chicago, Indianapolis & Louisville																														
Chicago & North Western	1	8	1	1	2	4	2	2			2	1			1	1	13	4	3	1	2	1	10						2	1
Chicago North Shore & Milwaukee																														
Chicago, Milwaukee & St. Paul	1	2	2	2	3	5	2	4			3	1		3			6	2		1		1		3				1	1	5
Chicago, Rock Island & Gulf		1															2	1												
Chicago, Rock Island & Pacific	2	1		1	1	2	3			1	3	1	1		1		14	3	1										2	1
Chicago Short Line		1																												
Chicago, St. Paul, Minneapolis & Omaha		2				4									1		9	2			1					2	1		1	
Chicago, Terre Haute & So. Eastern	1																1													
Cleve., Cin., Chicago & St. Louis	1	1		1		1		1								1	3					1		1					1	2
Clinchfield				1																										
Columbus & Greenville																														
Delaware & Hudson	2	1				4		1			1				2		3				2									
Delaware, Lackawanna & Western	1	1		1		2		1									3		1		3			5		1	1	1	1
Denver Rio Grande Western																	3											2		
Duluth & Iron Range																						1								
Duluth, Missabe & Northern																													1	
Erie	1		1	2		1	1				2						4	1	2	4	1	1	1					3	1	1
Escanaba & Lake Superior					1																									
Ft. Worth & Denver City								1									4													
Georgia Southern & Florida																														
Gulf, Mobile & Northern																														
Gulf & Ship Island		3				2		1			1						1	1		1										1
Hocking Valley	2																1	1												
Illinois Central	11	46	12	5	13	56	8	17	3	3	19	6	11	3	3	5	62	17	6	12	5	5	15	7	6	1	5	7	9	5
Kansas City Southern		1				1											2													
Lehigh & Hudson		1			1														2	2		2								
Lehigh Valley																			1				1							1
Long Island						2																								
Los Angeles & Salt Lake	1	6																	2											
Louisiana & Arkansas																														
Louisville, Henderson & St. Louis																							1							
Louisville & Nashville		11	1				1	1			2				1		1		2		1		1							
Maine Central																														
Michigan Central	5	6				6						1	1			2	10	3			4		1		6			3	2	
Minneapolis & St. Louis										No Report Received																				1
Minn., St. P. & Sault Ste Marie								1			1						1			1				1						
Mississippi Central							1	1											1											
Missouri-Kansas-Texas											1					1														
Missouri Pacific	3	9	6		5	4	4	4			8						13	2	1	2	7		9	2	1		3			7
Mobile & Ohio																														
Morrissey, Fernie & Michel		2				1					1						1	1												
Nashville, Chattanooga & St. Louis	1	3				1		1			2						1			1		1								1
New York Central	6	16			9	21	3	7	1	5	3	3	3	3	1	2	37	4	7	6	6	1	5	2	3		1	3	7	
New York, Chicago & St. Louis		3	2		1	1	1	2			1	1					5				2									
New York, New Haven & Hartford	5	8	1	2	3	2	1	1				2	3					1	1	1		1						1	3	2
New York, Susquehanna & Western																														
Norfolk Southern					1																									
Norfolk & Western	3	12	2		3	9	1		1	1		2	1		1		20		3		4		1	1				1	8	
Northern Pacific	2	2			1	5					2						4	3			2		4				2	2	2	1
Oregon Short Line		3	1									1					1						1							1
Oregon-Wash. R. R. & Navigation Co.		1				1								1			2													
Pacific Fruit Express	1	1				1		1			1						4					1							1	
Pennsylvania	1	1	10	2	11	10					2		2	2	2	2	7	3	1		8		2				4	5	7	
Pere Marquette	1	2			1	1		1			3						5	1			1	1	1							
Pittsburgh & Lake Erie											1							1	1		2		1						1	
Pittsburgh & Shawmut																	1		1											
Portland Terminal				1																		1								
Quebec Central																				1										
Reading	1					3					2						1		2		1									
Richmond, Fredericksburg & Potomac		6	1			2		1									1						2							
Rutland		1				1																								
Seaboard Air Line		5			1			2			3	1					3		2			1	1							
St. Louis-San Francisco				1							1										1			2						
St. Louis Southwestern																														
Southern Pacific				2		1		2			1			1	1			1					1						3	
Southern Railway											1						5													
Spokane, Portland & Seattle																	1						2							
Terminal R. R. Assoc. of St. Louis		1	1		1			1			2												3					2	1
Texarkana & Ft. Smith																	1													
Texas & Pacific	2	6	1	1	2	8	2	2			3	1	1		1		9			3	2		2						1	1
Union Railroad																							1							
Union Pacific	1														1	2	4													
Virginian																		1				1								
Wabash		1			12	5		2					1		1		2		2	1		1	1							
Western Pacific																								1						
Wheeling & Lake Erie		3						2			1						1		1											
Yazoo & Mississippi Valley								1									1													
TOTAL	72	236	55	32	93	203	39	74	7	13	93	26	37	20	20	22	345	68	80	54	46	24	74	37	24	5	20	30	72	39

	Flue Shop Machinery		Boiler Shop Machinery				Furnaces		Wood Working Machinery								Hoists			Trucks						
	Flue Welders	Misc.	Flangers	Forming Rolls	Riveters	Blowers	Oil	Electric and Others	Boring Machines	Mortisers	Surfacers and Jointers	Tenoners	Wood Cutting Saws	Others	Overhead Cranes	Car and Loco. Hoists and Drop Tables	Air	Electric	Chain	Electric	Gas	Trailers	Air Brake Test Racks	Air Compressors	Motors	Electric Welders
Akron, Canton & Youngstown													1								1			1		
Alabama Great Southern						1	2								1											1
Ann Arbor							1																			
Atchison, Topeka & Santa Fe		1			1	15	8	2			4		3	1	4	9	7		8	1	3	16		3	23	7
Atlantic City																										
Atlantic Coast Line	4		1	1	1	36	1				2							1	8					4		7
Baltimore & Ohio															5	1	1	16						3		
Bangor & Aroostook																		1								
Boston & Albany													3				6									
Bessemer & Lake Erie																		1								
Boston & Maine											1			1						4						3
Canadian National							No Report Received																			
Canadian Pacific											2			1						1						
Central of Georgia					3	10								1										2		1
Central New England																										
Central of New Jersey																	1		1	5	2	3		1	1	3
Charleston & Western Carolina																										
Chesapeake & Ohio		1				2												14		8						4
Chicago, Burlington & Quincy						17	1				2		3	1	1		1	4		3	20					1
Chicago & Eastern Illinois																										
Chicago Great Western							4																			
Chicago, Indianapolis & Louisville							1																			1
Chicago & North Western		2	3	2						2	3		15	3	3		2	1	1	9	2	3	3	7		2
Chicago North Shore & Milwaukee																	2									
Chicago, Milwaukee & St. Paul			1	1		1	6	1							1						3					4
Chicago, Rock Island & Gulf																										
Chicago, Rock Island & Pacific						1	1			2						1				1						34
Chicago Short Line																										
Chicago, St. Paul, Minneapolis & Omaha						3	2				1	1	1		1									2	3	4
Chicago, Terre Haute & So. Eastern																					1					
Clev., Cin., Chicago & St. Louis	2													1			1				2		2	2		
Clinchfield																										1
Columbus & Greenville													1	1												1
Delaware & Hudson										1	1		1	2						2				1		1
Delaware, Lackawanna & Western					1		2									1		3		2						1
Denver & Rio Grande Western			1								1		1													
Duluth & Iron Range		1																								1
Duluth, Missabe & Northern																	5									1
Erie	3				1					2	2		1	1		6	4	1		2	1	4	3	2	12	2
Escanaba & Lake Superior																										
Ft. Worth & Denver City													3							1						
Georgia Southern & Florida																										1
Gulf, Mobile & Northern						1	1										2								1	
Gulf & Ship Island									1		1														1	1
Hocking Valley																				1						1
Illinois Central	2	3	3	5	2	1	23	13	1	7	10	3	13	6												3
Kansas City Southern																										1
Lehigh & Hudson																		1								
Lehigh Valley																						12			1	
Long Island								1			1									1						
Los Angeles & Salt Lake																										
Louisiana & Arkansas			1								1															
Louisville, Henderson & St. Louis																										
Louisville & Nashville				1		2			1	1	1	1	1		1	1							1	1	7	2
Maine Central															1											
Michigan Central							4				1		3	3			9	1	2		1			3		2
Minneapolis & St. Louis							No Report Received																			
Minn., St. P. & Sault Ste Marie			1						1				2										1			
Mississippi Central																										
Missouri-Kansas-Texas											2		1											1	1	
Missouri Pacific						5			1	1	1		4	2	2			3						10	20	6
Mobile & Ohio														1									1			1
Morrissey, Fernie & Michel	1														1								1			
Nashville, Chattanooga & St. Louis													1							1	1	6				
New York Central		1	1	1	2	2	3		1				8	1			5		4	17			3	1	6	10
New York, Chicago & St. Louis	1												1					1								1
New York, New Haven & Hartford	1						1								5		6	2		16			1	2		4
New York, Susquehanna & Western																							1			
Norfolk Southern																										
Norfolk & Western	1				1								2		5			2		5	4	37		6		3
Northern Pacific							2		2				1	2			2						3			4
Oregon Short Line																										2
Oregon-Wash. R. R. & Navigation Co.	1		1										4					1								1
Pacific Fruit Express							4						2											1		
Pennsylvania		1	1	2			1					2			8	3	59		14	11	5		4	11		12
Pere Marquette			1				2						2	1				1						2		
Pittsburgh & Lake Erie					2		1						1							1						
Pittsburgh & Shawmut																										
Portland Terminal						1																				
Quebec Central																										
Reading			1												6					1	25	54	1	2	47	
Richmond, Fredericksburg & Potomac													2		1	2										
Rutland																										
Seaboard Air Line																								4		
St. Louis-San Francisco						2									1										8	1
St. Louis Southwestern														1										1		
Southern Pacific											1						3				2					
Southern Railway									1	3	4	3	5	5												4
Spokane, Portland & Seattle																								1	3	
Terminal R. R. Assoc. of St. Louis			1																							2
Texarkana & Ft. Smith																										
Texas & Pacific		1			1		1			2			7	2							2			1		6
Union Railroad																				1						
Union Pacific												1		1						2	1			1		
Virginian															3											
Wabash							1				1			1					2	1				6	4	2
Western Pacific								1															3			
Wheeling & Lake Erie			1																							2
Yazoo & Mississippi Valley																										
TOTAL	16	11	17	14	15	100	68	18	9	21	43	11	93	39	50	24	116	54	41	58	76	139	28	82	138	424

by the railroads. The tables show that the lathe, particularly the engine type, is by far the most widely used machine in the railroad shop. The orders for engine and axle lathes have increased 158 and 25, respectively, over those of 1925, while the orders for turret and wheel lathes have changed but little. These changes are none large enough, however, to indicate any definite change in trend. The purchase of milling and grinding machines has increased considerably.

The orders for radial drilling machines have increased from 65 to 93, and those of vertical, sensitive and bench drills, from 114 to 203. Such standard shop tools as planers, shapers and slotters were ordered in 1926 in practically the same number as last year. The

The Blacksmith Shop Requires Heavy Equipment

orders for vertical boring mills have increased from 56 to 93, while those for the horizontal types have remained the same. The orders for hammers, punches, shears and combination punches and shears have increased this year, particularly shears, for which the increase is over 100 per cent.

Included in the column headed "Miscellaneous boring mills" are car wheels and driving box boring mills and under "Portable machine tools" are cylinder boring bars, cylinder and dome facing machines, crank pin turning machines, cylinder facing machines and valve seat facing machines; the orders in this group have increased from 58 to 80. The column headed "Other grinding machines," which includes 346 various smaller types of grinders, or an increase of 114 over 1925, includes double end, twist drill, tool, universal and chaser grinders, as well as such types as saw blade, valve, knife, cock, bench and electric car wheel grinders. Except for a decrease in the orders for internal grinders, the orders for all types of grinders have increased, which is indicative of the growing use of grinding processes in railway shops. The column headed "Other presses," includes such types as bushing, driving box and spring forming presses. The orders for presses have increased from 82 to 98.

The orders reported for metal cutting saws for the past year have increased 60 per cent over the number reported during 1925. There has been no decided increase in the orders for bolt cutters; pipe cutters and threaders increased over 60 per cent.

In spite of the advent of modern steel passenger and freight cars, the railways have use for many different types of woodworking machinery. The different types of this equipment include borers, mortisers, surfacers, tenoners and saws. During 1925 orders were reported for 160 units of this equipment, and during the past year for 216 units.

Material Handling Equipment

Material handling devices and other shop equipment was listed for the first time last year. The large number of these units shown in the table indicate a marked tendency to provide railway shops with modern labor-saving facilities, as well as with machine tools. The orders for overhead cranes and car and locomotive hoists have increased from 23 to 50, and from 14 to 24, respectively. Orders are shown for 211 air, electric and chain hoists used for lifting car and locomotive parts in the shop.

The railroads are continuing to replace hand trucks with power trucks for handling material. During 1925, a total of 114 electric trucks, 17 gasoline trucks and 85 trailers for use with the power trucks were ordered. During the past year orders were placed for 98 electric trucks, 76 gasoline trucks and 135 trailers. This is a substantial increase over the orders placed during 1925.

The orders for furnaces and blowers for the past year have varied considerably, as compared with 1925. There is an increase of over 50 per cent in the number of

A Diversity of Wood Working Machines Are Required for Wood Mills

blowers ordered, while on the other hand the purchase of oil and electric furnaces has decreased 49 per cent. The column headed "Other furnaces" includes plate and electric rivet furnaces, as well as such equipment as tempering, brass, gas, hammer and forging furnaces.

The railroads ordered 28 air brake test racks during 1926. Eighty-two air compressors of various types were also ordered for shop use.

The railroads were requested to furnish a list of the electric and gas welding equipment ordered. This year's list shows orders for 158 electric welders, or 48 more than ordered during 1925. Much small gas welding equipment such as torches, regulators, gages, etc., was listed, but owing to the lack of space, it is impossible to classify this in the tables.

Illuminated Bill Board in Boston Advertising B. & M.'s Rail-Highway Co-ordinated Service

Orders for Highway Vehicles

Incomplete total indicates progress over 1925 *but does not reflect all of growth in railroad use of such equipment*

By James G. Lyne
Associate Editor, *Railway Age*

OF necessity, during the present infancy of the application of the use of automotive highway vehicles by the railroads, any attempt to secure complete information as to railroad orders of such equipment must be relatively unsatisfactory. The compilation which is published herewith may, it should be frankly admitted, be so characterized.

This situation is due to a variety of causes. In the first place, there are many railroad departments which utilize automotive equipment and in not all cases are data concerning such purchases kept in detailed and readily available form in a centralized location, such as is the case with orders for locomotives and rolling stock. Again the railroads are not accustomed to accounting for automotive units in the same detailed fashion as they are with their rail equipment.

From the manufacturers' standpoint, it should be remembered that whereas there are relatively few important manufacturers of rail equipment, the manufacturers of automotive vehicles run into the hundreds. Not all of these manufacturers fully understand the nature of the railroad business and the publicity which habitually attaches to it. Where they have a feeling of reticence in mentioning their dealings with the average private business concern and have not yet acquired the railroad viewpoint, they are not unlikely to look at disclosing their sales to railroads as an unwarranted exposure of their customers' private affairs. But perhaps the most important deterrent of all to the attempt to collect complete data is the fact that sales of automotive equipment are to quite a large extent made not by the manufacturers themselves but by local agents; and the manufacturers have no records of the names and the business of the purchasers of their equipment.

Again the figures of orders by railroads and their subsidiaries which can, in spite of the above obstacles, be secured lose much of their value as a measure of the total use of automotive vehicles in railroad service by reason of the fact that a large number—probably a majority—of the automotive vehicles used in railroad service are owned neither by the railroads themselves nor by their subsidiaries, but rather are supplied for railroad use by independent operators under contract.

The above facts are mentioned, not by way of an excuse, but merely as an explanation so that no reader will assume that the figures shown in the accompanying table of purchases of automotive equipment by the railroads is in any degree complete.

The total of the orders for automotive highway equipment by steam railroads in the United States in 1926 as reported to the *Railway Age* is 251, divided as follows: 173 buses, 65 trucks, and 13 passenger cars. This compares with orders for 162 vehicles (125 buses, 30 trucks and 7 passenger cars) reported for 1925 in the Annual Review Number a year ago. The detailed list of orders as reported to the *Railway Age,* follows:

Railway Purchases of Highway Motor Vehicles

For Service in the United States

Railroad	No.	Type of Vehicle	Model Designation	Bus Seating Capacity or Truck Capacity in Tons	Purchased by Railroad or Subsidiary	Where to be Used	Manufacturer
Akron, Canton & Youngstown	1	Truck	.....	1¼ ton	R.R.	M. of W.	Reo
	1	Coupe	.....	3 ton	R.R.	Employee	Ford
	1	Sedan	.....	5 ton	R.R.	Employee	Flint
Atlanta, Birmingham & Atlantic	1	Bus	Model LBM	20	R.R.	Employee	Graham Bros.
Atlantic Coast Line	1	Truck	.....	1 ton	R.R.	Stores	Ford
	1	Truck	.....	1 ton	R.R.	Stores	Chevrolet
Baltimore & Ohio	24	Bus	Type Y	29	R.R.	Pass.	Yellow
Boston & Maine	8	Bus	Model "Y"	29	R.R.	Pass.	Yellow
	5	Bus	Model "Y"	24	R.R.	Pass.	Yellow
	3	Bus	Model "X"	21	R.R.	Pass.	Yellow
	8	Bus	Model 50B	24	R.R.	Pass.	White
	4	Bus	Model "Y"	24	R.R.	Pass.	Pierce-Arrow
	1	Bus	Model "Y"	29	R.R.	Pass.	Pierce-Arrow
	1	Bus	Model 50A	24	R.R.	Pass.	White
	1	Bus	Street Car	20	R.R.	Pass.	Reo
Chicago & Alton	4	Bus	8-HC-35	35	Subsidiary	Pass.	Versare
Chicago, Indianapolis & Louisville	1	Truck	TT	1 ton	R.R.	Shop	Ford
	1	Roadster	.....	2 Pass.	R.R.	Commissary	Ford
Chicago, Milwaukee & St. Paul	1	Bus	.....	28	R.R.	Pass.	Yellow
					R.R.	Frt. & Bagg.	
Chicago, St. Paul, Minneapolis & Omaha	1	Truck	Model BC	1 ton	R.R.	Del'y	Graham Bros.
Cincinnati Northern	1	Coupe	.....	2	R.R.	Use by Frt. Ag't	Dodge
Cleveland, Cincinnati, Chicago & St. L.	1	Truck	.....	1 ton	R.R.	Shop	Ford
	1	Truck	.....	1 ton	R.R.	Shop	Ford
	1	Truck	.....	¾ ton	R.R.	Commissary	Dodge
Colorado & Southern	6	Bus	Type "Y"	30	Subsidiary	Pass.	Yellow
	2	Bus	Type "CH"	29	Subsidiary	Pass.	International Harvester
Copper Range	1	Bus	Model 53	21	Subsidiary	Pass.	White
Duluth & Iron Range	1	Truck	.....	¾ ton	R.R.	M. of W.	Dodge
	1	Truck	.....	½ ton	R.R.	M. of W.	Ford
Fonda, Johnstown & Gloversville	1	Bus	Suburban	.....	Subsidiary	.....	Mack
Great Northern	2	Bus	Parlor	.....	Subsidiary	.....	Mack
Illinois Central	1	Truck	U-4-C	3 ton	R.R.	Shop	Diamond "T" Motor Car Co.
	1	Truck	Model 40	3 ton	R.R.	Shop	White
	1	Truck	Model S	1¼ ton	R.R.	Shop	International Harvester
	1	Truck	Model 63	3 ton	R.R.	Shop	International Harvester
	1	Truck	Model T-6	1¾ ton	R.R.	Shop	Reo
	1	Truck	Model TCR	2 ton	R.R.	Shop	Dashiell Motor Co.
Indiana Harbor Belt	1	Truck	.....	1½ ton	R.R.	Stores	Graham Bros.
Long Island	1	Truck	.....	1	R.R.	Elec. Dept.	Ford
Maine Central	2	Bus	.....	29	Subsidiary	Pass.	Am. Car & Fdy.
Missouri-Kansas-Texas	2	Bus	.....	25	R.R.	Employee	Mack
	1	Touring	.....	5	R.R.	Employee	Ford
Nashville, Chattanooga & St. Louis	3	Bus	Type Z	29	Subsidiary	Pass.	Yellow
	2	Truck	Type Z	5 ton	Subsidiary	Bag. Exp. & Mail	Yellow
New York, New Haven & Hartford	1	Truck	40	3½ ton	R.R.	Frt.	White
	1	Truck	TT	1 ton	R.R.	M. of W.	Ford
	1	Truck	TT	1 ton	R.R.	M. of W.	Ford
	6	Coupe	58	3	Subsidiary	Employee	Chrysler
	1	Bus	Safety Coach	30	Subsidiary	Pass.	Fageol
	10	Bus	Safety Coach	29	Subsidiary	Pass.	Fageol
	7	Bus	A.B.	27	Subsidiary	Pass.	Mack
	10	Bus	A.B.	29	Subsidiary	Pass.	Mack
	2	Bus	Z	29	Subsidiary	Pass.	Pierce-Arrow
	1	Truck	Speedwagon	2 ton	Subsidiary	Mech. & Stores	Reo
	1	Bus	50-A	27	Subsidiary	Pass.	White
	21	Bus	50-B	29	Subsidiary	Pass.	White
	15	Bus	Y	29	Subsidiary	Pass.	Yellow
Pennsylvania	1	Truck	.....	1½ ton	R.R.	.....	
	1	Truck	.....	¾ ton	R.R.	.....	
	1	Truck	.....	3½ ton	R.R.	.....	
	1	Truck	.....	3½ ton	R.R.	.....	
	1	Truck	.....	½ ton	R.R.	.....	
	1	Truck	.....	½ ton	R.R.	.....	
	2	Truck	.....	2 ton	R.R.	.....	
	1	Truck	.....	2½ ton	R.R.	.....	
	1	Truck	.....	½ ton	R.R.	.....	
	1	Truck	.....	1½ ton	R.R.	.....	
	1	Truck	.....	2 ton	R.R.	.....	
	2	Bus	.....	29	R.R.	.....	White
	3	Bus	.....	21	R.R.	.....	White
	1	Truck	.....	1½ ton	R.R.	.....	
	1	Truck	.....	2 ton	R.R.	.....	
	2	Truck	.....	1 ton	R.R.	.....	
	3	Truck	.....	2 ton	R.R.	.....	Autocar
	1	Truck	.....	5 ton	R.R.	.....	Autocar
	2	Truck	.....	2½ ton	R.R.	.....	
	1	Truck	.....	1½ ton	R.R.	.....	
	4	Truck	.....	1 ton	R.R.	.....	
	1	Truck	.....	2½ ton	R.R.	.....	
	1	Truck	.....	1 ton	R.R.	.....	
	5	Truck	.....	¾ ton	R.R.	.....	
	1	Truck	.....	5 ton	R.R.	.....	
	1	Truck	.....	3 ton	R.R.	.....	
	3	Truck	.....	1½ ton	R.R.	.....	
Rutland	2	Bus	Type X	20	Subsidiary	Pass.	Yellow
Norfolk & Western	1	Truck	Speedwagon	1¼ ton	R.R.	Shop	Reo
Norfolk Southern	2	Bus	.....	29	Subsidiary	Pass.	White
		Bus	.....	29	Subsidiary	Pass.	Mack
Southern Pacific	8	Bus	.....	25	R.R.	.....	
	3	Bus	.....	29	R.R.	.....	Mack
	3	Bus	.....	58	Subsidiary	Pass.	Fageol
Southern	1	Truck	Model 20	2 ton	R.R.	Shop	White
	1	Touring	.....	5	R.R.	Employee	Ford
Union Pacific	2	Bus	City	.....	Subsidiary	.....	Mack

Lehigh Valley Rail Motor Train Consisting of a Motor Car with Two 250-hp. Gasoline-Electric Power Plants, and Three Trailers—Built by the J. G. Brill Company

Orders for Rail Motor Equipment

Capacity of power plants and weight of cars increasing— More trailers are being used

By C. B. Peck
Mechanical Department Editor, *Railway Age*

THERE has been a yearly increase in the number of rail motor cars and trailers ordered by the railroads since these orders were first reported by the *Railway Age* for 1922, although the increase in 1926 is not large numerically. Beginning with 51 cars reported for 1922 for use on the railroads in the United States, orders for 77 were reported for 1923; for 120 in 1924, and for 149 in 1925. Orders were placed for 158 motor cars and trailers by the railroads of the United States during 1926. A comparison of the total number of cars ordered both for use in the United States and Canada and for export, from 1922 to 1926, inclusive, is shown in the table.

Orders for Rail Motor Cars and Trailers

	1922	1923	1924	1925	1926
For service in the United States	51	77	120	149	158
For service in Canada	7	3	12	7	4
For export	1	22	..	34	32
Total	59	102	132	190	194
Motor cars	50	93	112	171	170
Trailers	9	9	20	19	24

Since the beginning of the use of rail motor cars, the trend from year to year has been uninterruptedly toward the use of heavier cars with power plants of larger capacity. Just how these trends have been operating during 1926 as compared with 1925 is set forth in the tables of weights and horsepowers, in which all of the motor car units for which the data are complete have been classified in groups representing ranges of weights and horsepowers, respectively.

It will be seen that while the weight of the largest number of cars ordered during 1925 fell between 50,000 lb. and 75,000 lb., the largest group in 1926 is in the 75,000-lb. to 100,000-lb. group. Furthermore, it will be seen that there has been a marked increase in the number of cars ordered with weights of over 100,000 lb.

Comparison of Rail Motor Car Weights, U. S. and Canada

Weights	1926	1925
25,000 lb. and under	7	6
Over 25,000 lb. to and including 50,000 lb.	7	19
Over 50,000 lb. to and including 75,000 lb.	2	74
Over 75,000 lb. to and including 100,000 lb.	79	27
Over 100,000 lb.	38	9

Power Plant Capacity of Rail Motor Cars, U. S. and Canada

Horsepower	1926	1925
100 or less	14	13
Over 100 to and including 125	7	5
Over 125 to and including 150	..	9
Over 150 to and including 175	1	20
Over 175 to and including 200	3	49
Over 200 to and including 250	65	36
Over 250 to and including 300	26	2
Over 300	19	2

Considering the power plant capacity, 20 of those ordered in 1925 fell within the 150-hp. to 175-hp. group; 49 in the 175-hp. to 200-hp. group, and 36 to the 200-hp. to 250-hp. group. For 1926, by far the larger propor-

tion of the motor cars ordered have power plants of over 200-hp. capacity, 65 of these falling between 200 and 250 hp., 26 between 250 and 300 hp., and 19 over 300 hp. Included in this last group are several orders for cars with power plants having capacities of 440 hp. and 500 hp.

These large power plants and the relatively high weights accompanying them mark a steady growth in the rail motor car field from the original idea of single units for light branch line service, into the steam passenger train field, of several car trains. All of the larger cars are designed to handle at least one trailer and those with the higher capacity power plants are designed to handle more than one trailer. An outstanding example of this trend is illustrated at the head of this article where a motor car equipped with two 250-hp. motors is intended to handle three trailers, with a total seating capacity of between 240 and 250 persons in addition to a large baggage space. The trend in the use of trailers is brought out in one of the tables.

A Combined Mail, Baggage and Passenger Coach Equipped with Electromotive Company's Gasoline-Electric Power Plant of 200 hp. Capacity

Among other developments in this field, experiments are now under way on the Boston & Maine with the use of distillate in place of gasoline in a modified gasoline motor.

A list of the orders for rail motor cars and trailers placed during 1926 follows.

Orders for Gasoline, Gas-Electric or Storage Battery Rail Motor Cars

For Service in the United States

Purchaser	No.	Motor or trailer	Type of power plant	Horse-power	Seating Capacity	Length of Bagg. Compt. Ft. In.	Weight	Builder
Atlantic & Western	1	Trailer	.....	...	30	.....	15,000	Edwards
Baltimore & Ohio	5	Motor	Gas-Electric	125	64	.....	113,200	Electro-Motive-St. L. Car
Batesville, South Western	1	Motor	Gasoline	50	50	.....	20,000	Bro.-Weller & Kissel
Bcnla & Western	1	Motor	Gas-Electric	100	25	9 0	18,000	Edwards
Boston & Maine	8	Motor	Gas-Electric	250	84	12 0	103,080	Osgood Bradley-Elec. Motive
	2	Motor	Gas-Electric	250	54	16 0	94,340	Osgood Bradley-Elec. Motive
Cape Fear	3	.....	Gasoline	100	30	8 0	18,000	Edwards
Central Vermont	2	Motor	Gas-Electric	250	51	14 11	91,000	J. G. Brill Co.
	2	Trailer	.....	...	36	25 5	56,000	J. G. Brill Co.
Chicago & Alton	1	Motor	Gasoline	208	20	40 0	90,000	Railway Motors Corp.
Chicago, Burlington & Quincy	2	Motor	Gas-Electric	275	..	40 0	96,000	Electro-Motive-St. L. Car
	2	Motor	Gas-Electric	275	37	22 0	96,000	Electro-Motive-St. L. Car
	1	Motor	Gas-Electric	275	55	26 0	96,000	Electro-Motive-St. L. Car
Chicago & Northwestern	8	Motor	Gas-Electric	220	42	17 0	90,000	Electro-Motive-St. L. Car
Chicago, Milwaukee & St. Paul	1	Motor	Gas-Electric	220	..	.....	79,000	Electro-Motive-St. L. Car
Chicago, Rock Island & Pacific	5	Motor	Gas-Electric	275	..	11 0	98,000	Electro-Motive-St. L. Car
Chicago, Springfield & St. Louis	3	.....	.....	...	..	.....	.....	J. G. Brill Co.
Clev., Cinn., Chic. & St. Louis	1	Motor	Gas-Electric	250	..	31 0	92,520	J. G. Brill Co.
Death Valley	1	Motor	Gasoline	70	34	13 10	30,000	J. G. Brill Co.
Duluth & Iron Range	1	Motor	Gasoline	208	48	24 0	94,000	Railways Motors Corp.
Duluth, Missabe & Northern	1	Motor	Gasoline	208	30	27 0	92,000	Ry. Motors-Co. Shops
East Brd. Top	1	Motor	Gas-Electric	250	50	10 0	88,000	J. G. Brill Co.
Great Northern	4	Motor	Gas-Electric	220	..	49 0	76,000	Electro-Motive-St. L. Car
	2	Motor	Gas-Electric	275	..	49 0	86,900	Electro-Motive-St. L. Car
	2	Motor	Gas-Electric	220	42	17 0	76,000	Electro-Motive-St. L. Car
	3	Motor	Gas-Electric	275	..	47 0	94,000	Electro-Motive-St. L. Car
	1	Motor	Gas-Electric	275	37	25 0	96,000	Electro-Motive-St. L. Car
	1	Motor	Gas-Electric	250	..	(30-B) (15-M)	92,000	J. G. Brill Co.
Hampton & Branchville	1	Motor	Gas-Electric	100	34	15 0	34,000	Edwards
Lehigh & New England	1	Motor	Gas-Electric	175½	86	.....	86,350	J. G. Brill Co.
Lehigh Valley	1	Motor	Gas-Electric	440	56	28 11	107,500	Standard Steel
	1	Motor	Gas-Electric	440	51	20 2	107,500	Standard Steel
	1	Motor	Gas-Electric	440	61	14 4	107,500	Standard Steel
	1	Motor	Gas-Electric	440	16	25 4	107,500	Standard Steel
	4	Trailer	.....	...	78	.....	54,000	Standard Steel
	1	Trailer	.....	...	..	58 0	54,000	Standard Steel
	1	Trailer	.....	...	..	42 1½	54,000	Standard Steel
	1	Motor	Gas-Electric	500	19	22 8½	125,000	Am. Car & Fdy.
	1	Motor	Gas-Electric	500	24	34 10½	125,000	Am. Car & Fdy.

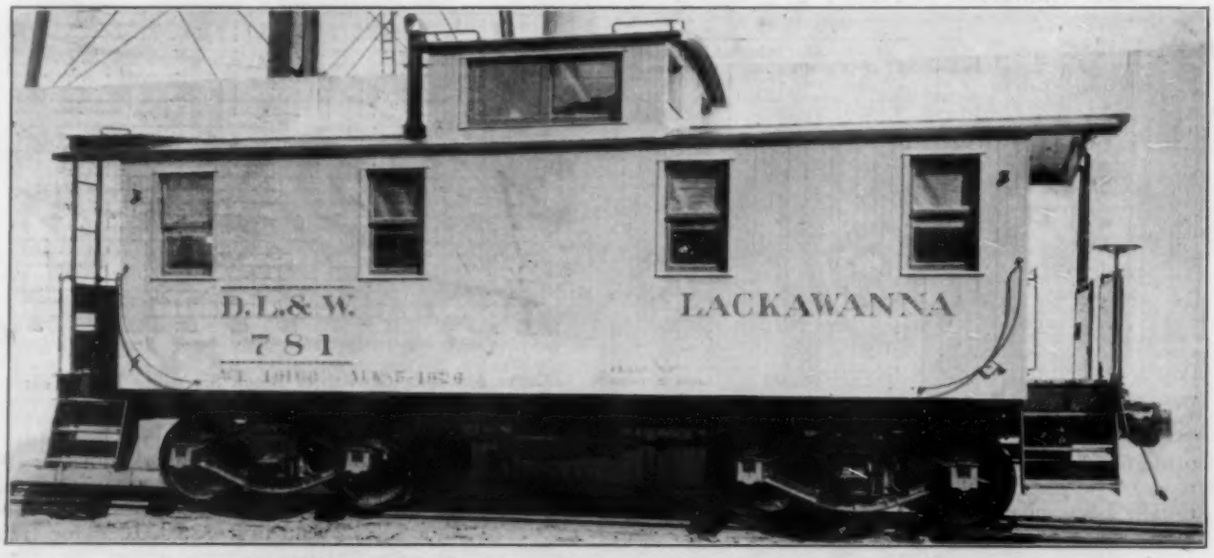
Purchaser	No.	Motor or trailer	Type of power plant	Horse-power	Seating Capacity	Length of Bagg. Compt. Ft. In.	Weight	Builder
	1	Trailer	.....	...	..	57 6	54,000	Am. Car & Fdy.
	6	Trailer	.....	...	78	.....	54,000	Am. Car & Fdy.
	1	Motor	Gas-Electric	500	19	37 9½	125,000	J. G. Brill Co.
	1	Motor	Gas-Electric	500	19	22 8½	125,000	J. G. Brill Co.
	1	Motor	Gas-Electric	500	..	56 8	125,000	J. G. Brill Co.
	1	Motor	Gas-Electric	500	..	41 6	125,000	J. G. Brill Co.
	1	Motor	Gas-Electric	440	36	29 0	116,000	Electro-Motive Co.
	1	Motor	Gas-Electric	440	16	25 0	116,000	Electro-Motive Co.
	1	Motor	Gas-Electric	440	61	14 0	116,000	Electro-Motive Co.
	1	Motor	Gas-Electric	440	51	20 0	116,000	Electro-Motive Co.
	5	Motor	Gas-Electric	500	19	40 0	130,000	J. G. Brill Co.
	7	Trailer	Gas-Electric	...	76	.....	59,000	J. G. Brill Co.
Maryland & Pennsylvania	1	Motor	Gas-Electric	275	64	.....	90,000	Electro-Motive-St. L. Car
Midd. & Unionville	1	Motor	Gasoline	70	38	11 3	30,000	J. G. Brill Co.
Missouri & Pacific	1	Motor	Gas-Electric	220	34	19 0	78,000	Electro-Motive-St. L. Car
	1	Motor	Gas-Electric	220	42	11 0	78,000	Electro-Motive-St. L. Car
	3	Motor	Gas-Electric	220	40	26 0	90,000	Electro-Motive-St. L. Car
	3	Motor	Gasoline	70	34	13 10	31,000	J. G. Brill Co.
Mobile & Ohio	2	Motor	Gas-Electric	105	40	16 8	93,880	Electro-Motive-St. L. Car
Morehead & Northfolk	1	Motor	Gas-Electric	100	41	9 5	34,000	Edwards
New York Central	1	Motor	Oil-Electric	200	46	16 9	179,000	Company Shops
N. Y., N. H. & Hartford	5	Motor	Gas-Electric	250	90	11 3	103,880	J. G. Brill Co.
Nevada Central	2	Motor	Gasoline	60	20	10 0	20,000	Meister Co.
Northern Pacific	2	Motor	Gas-Electric	220	32	23 0	90,000	Electro-Motive-St. L. Car
	1	Motor	Gas-Electric	220	52	26 0	90,000	Electro-Motive-St. L. Car
Oregon Short Line	4	Motor	Gas-Electric	275	24	22 6	94,000	Electro-Motive-St. L. Car
Oregon-Washington & Navi	1	Motor	Gas-Electric	275	48	20 2	94,000	Electro-Motive-St. L. Car
Pennsylvania	2	Motor	Gas-Electric	250	60	.....	90,000	J. G. Brill Co.
Pitts. Sh. & Nthn	1	Motor	Gasoline	190	54	19 3	55,000	J. G. Brill Co.
Reading	3	Motor	Gas-Electric	280	32	10 11½	92,500	J. G. Brill Co.
	1	Trailer	.....	...	60	.....	46,000	J. G. Brill Co.
St. Louis-San Francisco	4	Motor	Gas-Electric	250	50	9 4¾	85,000	J. G. Brill Co.
	1	Motor	Gasoline	208	40	.....	80,000	Rys. Motors Corp.
Wabash	1	Motor	Gas-Electric	220	..	.....	77,000	Electro-Motive-St. L. Car
	1	Motor	Gas-Electric	220	..	.....	76,000	Electro-Motive-St. L. Car
Union Pacific	4	Motor	Gas-Electric	220	70	.....	90,000	Electro-Motive-St. L. Car
	1	Motor	Gas-Electric	275	70	.....	94,000	Electro-Motive-St. L. Car
Wheeling & Lake Erie	2	Motor	Gas-Electric	250	44	15 0	85,000	J. G. Brill Co.
	1	Motor	Gas-Electric	250	46	15 0	85,000	J. G. Brill Co.

Export

Purchaser	No.	Motor or trailer	Type of power plant	Horse-power	Seating Capacity	Length of Bagg. Compt. Ft. In.	Weight	Builder
Cahu Railway & Land Co	2	Motor	Gasoline	208	70	.....	50,000	Railways Motors Corp.
Consolidated Cuba	6	Motor	Gasoline	70	38	11 3	31,000	J. G. Brill Co.
Inscon Cornellia & Giler Bend	1	Motor	Gas-Electric	100	30	9 0	19,000	Edwards
International Motor	1	Motor	Gas-Electric	250	75	15 3	100,000	Osgood Bradley Car Co.
National Ry. of Mexico	5	Motor	Gas-Electric	100	25	9 0	18,000	Edwards
South America	17	Motor	Gas-Electric	100	25	9 0	18,000	Edwards

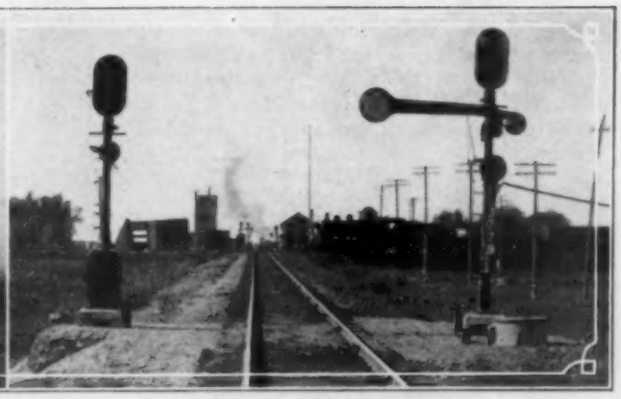
Canada

Purchaser	No.	Motor or trailer	Type of power plant	Horse-power	Seating Capacity	Length of Bagg. Compt. Ft. In.	Weight	Builder
Canada & Gulf Terminal	1	Motor	Gasoline	190	50	16 3	55,000	J. G. Brill Co.
Temiskaming & Northern Ontario	2	Motor	Gas-Electric	250	77	15 11	.....	J. G. Brill Co. & Ott. Car
Victorian	1	Motor	Gas-Electric	220	54	11 0	78,000	Electro-Motive Co.



Caboose Built for the Delaware, Lackawanna & Western by the Magor Car Corporation

Color-position Light Signals on the Baltimore & Ohio



Automatic Signaling Interlocking on the Great Northern and Northern Pacific

1926 Greatest Year in History for Signals and Interlocking

Records established for mileage and levers installed—New interest in spring switches and automatic interlockings

By John H. Dunn

Signaling Editor, *Railway Age*

THE completion of automatic block signals on 4,992.7 miles of road in the United States and Canada during 1926 established a new record, being a marked increase over the 2,938 miles equipped in 1925, which was the maximum program undertaken in the past 10 years. The largest mileage completed in any year prior to 1926 was in 1913, when 4,350 miles of signaling was installed, while the next largest year was 1910 with a mileage of 3,473. Several installations made in Canada during 1926 covered over 100 miles of road. The installation of automatic signals on an unusually large mileage during 1926 can be accounted for by the fact that numerous roads, faced with the necessity of handling a rapidly growing traffic during the last few years without corresponding increases in trackage, have installed signals to reduce the space between trains and have built interlockings to eliminate train stops. Reports of work under way and contemplated indicate that construction for 1927 will equal or exceed that of 1926.

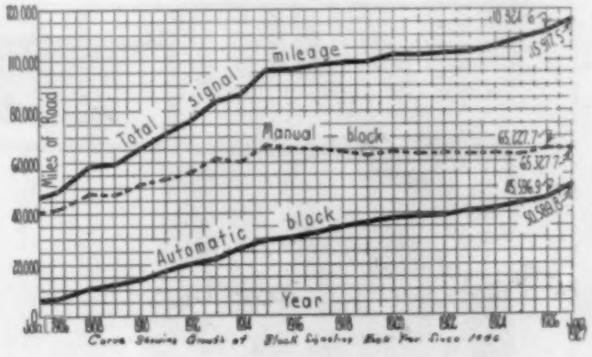
Interlocking construction during 1926 likewise established a new record, 2,123 levers having been installed at new plants and 736 levers having been used for replacements at various locations, a total of 2,859 levers for regular interlocking, which is in addition to 194 desk levers and 89 switch machines for remote control.

During the last three years, 44 Class 1 roads have also been required to spend over $25,000,000 for train

Total Construction, 19 Years, I. C. C. Reports

Year	Miles of road: Construction of automatic block	Construction of manual block	Net addition to miles of road operated by block system
1908	1,387.6	—517.6	870.0
1909	2,047.1	4,162.2	6,209.3
1910	3,473.8	2,037.3	5,511.1
1911	2,623.4	2,517.2	5,140.6
1912	1,883.9	5,656.2	7,540.1
1913	4,350.5	—1,563.4	2,787.1
1914	3,294.2	6,577.5	9,871.7
1915	1,079.0	—1,112.0	—33.0
1916	2,012.1	—179.8	1,832.3
1917	2,238.5	—1,114.7	1,123.8
1918	1,796.3	—1,430.3	366.0
1919	979.4	1,007.1	1,986.5
1920	575.1	—575.7	—0.6
1921	517.6	66.5	584.1
1922	1,004.1	—328.0	676.1
1923	1,471.5	1,282.0	2,753.5
1924	2,302.0	112.0	2,190.0
1925	1,758.0	976.6	2,734.7
*1926	4,992.9	100.0	5,092.9

* Figures for 1926 are ours.



Curve Showing Growth of Block Signaling Each Year Since 1906

control, which no doubt caused the postponement of some expenditure for signaling in 1924 and 1925 on these roads. However, this was not a hindrance in 1926; instead it served as an incentive for some roads, such as the Missouri Pacific and the Nickel Plate, to proceed with extensive signal installations.

With the increasing demand that signaling, in addition to promoting safety, must also produce increased track capacity, more study is being devoted to the design of signal systems to meet local traffic conditions. For example, the signals on one division of the Chesapeake & Ohio have been relocated so as to provide block spacing between trains on the basis of time rather than distance. The Central of Georgia and the New York Central have under construction unique single-track installations, whereby all train movements will be directed by signal indication without written train orders, while the important switches will be operated by remote control machines so that under normal operation the number of train stops will be reduced to a minimum.

Several other outstanding features mark the railroad signaling of 1926. Spring switches have been installed on at least nine roads to eliminate train stops at yard switches, at passing tracks and at the ends of double track, saving as much as $5,000 a year for a single installation. Interlocking limits have been extended to include in one tower the control of what was previously handled in two or more plants, thus reducing operating costs $4,500 and $10,500 a year respectively in two specific cases. Interlocking plants at railroad crossings or junctions have been replaced by automatic signaling plants at a number of places with savings of from $4,500 to $6,000 a year in specific cases. On at least 10 roads, gates at highway crossings have been replaced by automatic wig-wags or flashing-light signals, thereby reducing operating costs from $640 to $2,750 at each crossing. Savings in operating expenses totaling $180,000 in 1926, were accomplished on one road by the use of spring switches, changes in interlockings and highway crossing protection made during the last three years.

Automatic Signaling Completed in 1926

A total of 4,992.9 miles of road, including 3,000 miles of single, 1,944.9 of double and 6.5 miles of three track lines was equipped with automatic block signals in 1926. The single-track mileage for 1926 shows an increase of 1,226.3 miles over that of the previous year. The largest installations were 275 miles between Deetz, Calif., and Springfield, Ore., on the Southern Pacific; 268 miles between Lurgan, N. D., and Minot on the Great Northern; and 240 miles on the Missouri Pacific in Arkansas, while separate installations on different parts of certain railroads gave large totals; for example, that for the Southern Railway System comprised 193 miles of single track signaling.

For several years the signaling of double-track lines has chiefly been confined to short stretches on grades or near terminals. However, in 1926 over 1,929 miles of double track were so equipped as compared with an average of about half this much during the last five years. One reason for this marked increase in double-track signaling is that desirable increased track capacity has thereby been secured by the closer spacing of trains. One road in particular reports a reduction of $18,000 annually in operating expense occasioned by the elimination of three interlockings previously required with manual block operation on 78 miles. Two extensive installations of double-track signaling completed in 1926 were 347 miles on the Florida East Coast between Jacksonville, Fla., and Miami and 168 miles on the Baltimore & Ohio through Indiana and eastern Ohio.

In 1926, for the first time the number of light signals has exceeded the semaphores to a decided extent, 6,511 light signals having been installed as compared with 3,283 semaphores. Of the light signals 5,413 were color-light, 460 color-position-light and 638 position-light. Included in these figures are 802 color-light signals used to replace semaphores on 628 miles of double track between Seminary, Va., and Atlanta, Ga., on the main line of the Southern. This mileage, however, is not included in the totals for new signaling.

As the year 1926 closed, 1,344.6 miles of single track and 585 miles of double-track signaling were under construction. The majority of this mileage is in the southern half of the United States where construction work can be continued through the colder months. The Southern Railway System has a total of 486 miles of signaling under construction. The Southern Pacific has signaling under way on 152 miles, while the Norfolk & Western has nearly completed 119 miles on single track and the Seaboard Air Line is working on 158 miles of single track automatics.

The construction of interlocking plants in the United States and Canada during 1926 included 107 new plants as compared with 92 in the year previous. In addition to the new plants, 114 interlockings were rebuilt requiring new machines, additional levers, extensive outside reconstruction and additional locking circuits. The new plants together with those rebuilt include a total of 2,859 levers as compared with 1,872 levers installed in 1925. The list for 1926 includes 34 mechanical, 35 electrical, 16 electro-pneumatic and 26 electro-mechanical plants. The 131-lever electric plant at Suspension Bridge, N. Y., on the New York Central was the largest plant installed last year.

It is noticeable that the majority of the plants involve small machines, indicating that interlocking facilities are being provided more extensively at outlying crossings, junctions, and yards where train stops had not previously constituted such an important interference to train operation. As an example of this, the Seaboard Air Line installed or has under construction 30 interlocking plants at crossings or junctions, for the purpose of eliminating train stops so as to quicken the schedules of through trains. One road installed a $6,000 mechanical interlocking plant at a railroad grade crossing located at the bottom of ruling grades in both directions from the plant, and the elimination of the

Table A—Automatic Block Signals Completed During 1926

Road	Location	Miles of road	No. of signals	Manufacturer
A. T. & S. F.	Carrollton Jct., Mo. to Hardin	16.7d	14s	Union
	Lawrence, Kan. to Spencer	28.6s	33s	Union
	Pauline, Kan. to Emporia Jct.	53.7s	94s	Union
	Cicero, Kan. to Wellington	7.4d	14s	Union
	LaJunta, Colo. to Trinidad	81.8s	158s	Union
	Hutchinson, Kan.	....	3s	Union
	Abajo, N. M. to Isleta	11.1s	18s	Union
	Meridian, Tex. to Temple	62.4s	107s	Union
	Birds, Tex. to Polks	2.3d	3s	Union
	Angiola, Calif. to Shirley	31.2s	54s	Union
	Fallbrook Jct., Calif. to Escondido Jct.	3.0s	6c	Union
	Redondo Jct., Calif. to Hobart	2.5d	2s	Union
	Mission Tr., Calif. to Los Angeles	1.1d	4c	Union
A. C. L.	Java, S. C. to Lanes	46.1d	90s	Union
	Drayton, S. C. to Yemassee	49.4d	100s	Union
	Burrough, Ga. to Altamaha	37.6d	77s	Union
	Jacksonville, Fla. to Yukon	0.9s / 8.3d	13s	Union
	Orange City Jct., Fla. to Sanford	1.3s / 11.3d	23s	Union
A. & W. P.	Milestead, Ala. to Montgomery	30.0s	32s	Union
B. & O.	St. George, N. Y. to Arlington	5.1d	30cp	Union
	Waverly, Md. to Huntingdon Ave.	1.0d	4cp	Union
	New Castle Jct., Pa. to Akron Jct., Ohio	71.0d	133cp	Union
	Sterling, Ohio to Greenwich	35.8d	62cp	Union
	Attica, Ohio to Deshler	54.2d	94cp	Union
	Defiance, Ohio to Milford Jct., Ind.	77.9d	137cp	Union

Road	Location	Miles of road	No. of signals	Manufacturer
Bingham & Garfi'd.	Magna, Ut.	17.0s	49s	General
C. N. (Atl. Reg.)	River du Loup, Que. to Yard	0.5s	1s	Union
	Moncton, N. B. to Yard	0.5s	1s	Union
	Sackville, N. B.	0.5s	1s	Union
(Cent. Reg.)	Palmerston, Ont. to Yard	....	2s	General
(West. Reg.)	Superior Jct., Ont.	0.5s	1s	General
C. P.	Busteed, Ont. to Kenore	10.0s 4.0d	11s	Hall Union
	Kirkella, Man. to Whitewood, Sask.	45.0s 2.0d	79s	Union
	Rufus, Sask.	1.1s	1s	Union
	Parkbeg, Sask.	2.3s	1s	Union
	Fauna, Sask.	2.0d	2s	Union
	Lake Louise, Alta. to Stephen, B. C.	7.0s	9s	Union
	Glacier, B. C. to Albert Canyon	20.7s 1.5d	39s	Union
	Vancouver, B. C.	1.7s	2s	Union
	Burpee, N. B.	....	2s	Hall
	Quebec, Que.	0.21s	1c	Hall
	Marden, Ont.	2.0s	2s 2c	Union Hall
C. of Ga.	Trammells, Ala. to Sylacauga	6.6s	9c	Union
C. B. & Q.	Newport, Minn. to St. Paul.	7.0s	14L	General
	Harvard, Nebr. to Kenesaw.	30.3s	66c	General
	Grand Island, Neb. to Revenna	37.4s	61c	General
	Wray, Colo. to Akron	53.3s	94c	General
	Clarksville, Mo. to Old Monroe	34.0s	79c	General
	Hannibal, Mo. to Mark.	12.2s	25c	General
	Ewbanks, Ill., to Golden	20.4s	44c	General
	Cameron, Mo. to Saxton	28.5s	56c	General
	Beverly, Mo. to Block 36	9.1s	12c	General
C. M. & St. P.	Newport, Minn.	6.7d	...	Union
C. S. S. & S. B.	Chicago (Kensington) to South Bend, Ind.	59.0s 16.0d	47c	Union
C. N. S. & M.	No. Chicago, Ill. to State Line	11.0d	18c	Union
C. R. I. & P.	Chicago, 25th St. to 61st St.	5.0d	38c	Union
	Chicago, 63rd St. to 86th St.	3.0s	10c	Union
	White City, Kan. to Jones	12.0d	6s	Union
D. L. & W.	Upper Hack, N. J. to Lyndhurst	3.8d	13c	Union
	Buffalo, N. Y.	....	1L	Union
Erie	Salamanca, N. Y. to Cuba Jct.	29.0d	61c	Union
F. E. C.	Jacksonville, Fla. to Miami.	347.0d	556c	General
Ft. W. & D. C.	Ft. Worth, Tex.	5.0s 2.5d	...	General
G. N.	Lurgan, N. D. to Minot.	4.6d 268.0s	451c	Chicago
	Tye, Wash. to Skykomish	22.8s	31c	General
I. C.	Chicago to Kensington	32.8t	122c	Union
	Bloomington, Ill. to Normal	1.1s	3c	Union
Interborough	New York, N. Y. to Hunter's Point	....	14p	.....
	New York, N. Y. to Fifth Avenue	....	4p	.....
L. V.	Pattenburg, N. J. to Bloomsbury	6.5t	9s	General
L. I.	Flushing, N. Y. to Great Neck	7.0d	18s 2c	Union .....
	Flushing, N. Y. to Whitestone Ldg.	3.7s	4s	Union
L. & N.	New Orleans, La. to Pascagoula, Miss.	93.8s 4.2d	210s 2c	General Union
	Ophelia, Ky. to Conway	25.0d	50s	Union
	Patio, Ky. to Flanagan	4.0d	8s	Union
M-K-T.	McKittrick, Mo. (Yard)	4.0s	6s	Union
M. P.	Poplar Bluff, Mo. to Bald Knob, Ark.	112.0s 13.0d	6s 174c	General .....
	Little Rock, Ark. to Ensign	6.5d	2c	General
	Benton, Ark. to Clear Lake Jct.	112.0s	6s 171c	General
	Cole Jct., Mo. to Rock Creek Jct.	144.9s 3.7d	2s 229c	General
	Etlah, Mo. to Hermann	4.9d	10c	Handlan
	Gasconade, Mo. to Isbell	18.8d	21c	Buck Co.
	Osage, Mo. to Moreau River	3.6d	4c	and
	Jefferson City, Mo. to Cole Jct.	4.0d	8c	Chicago
M. & O.	Perry, Tenn. to Ruslor, Miss.	51.3s	87c	General
N. Y. C.	Putnam Jct., N. Y. to Ice Pond	4.0d	10c	Hall
(Lines East)	Churchville Jct., N. Y. to Buffalo	54.0d	102c	Hall
	Mt. Marion, N. Y. to Ravena	32.0d	69c	Hall
(Lines West)	Chicago to Englewood (Chicago)	5.6d	55c	General
C. C. C. & St. L.	Terre Haute, Ind. to Pana, Ill.	98.3s	112c	Union
	Marion, Ohio to Quincy	51.4d	44s 108c	General Union
	Glen Echo, Ohio to Bellefontaine	25.8d	48c	Union
	Quincy, Ohio to Indianapolis, Ind.	19.5s 109.0d	165c	Union
	Cincinnati, Ohio to Greensburg, Ind.	59.5d	110c	Union
	Beech Grove, Ind. to Dix	8.1d	14c	Union
B. & A.	West Warren, Mass. to Warren	3.5s	4L	Union
N. Y. N. H. & H.	Shelton, Conn. to Danbury	29.3d	50c	General
	Sharon Hgt., Mass. to Readville	9.0d	18s	General
	Attleboro, Mass. to Hebronville	3.3d	6s	General
New England	Danbury, Conn. to Holmes, N. Y.	17.3d	30c	General
N. & W.	Vera, Ohio to Clare	95.8s	273p	Union
	Cooper, W. Va. to Cliff	4.2s	14p	Union
	Williamson, W. Va. to Toler, Ky.	3.1s	12L	Union
No. Ohio P. & L.	Canton, Ohio to Massillon	8.0d	c	Nachod
	Kenmore, Ohio to W. Berleston	4.5s	p	Nachod
Pacific Elec.	Morton Sta., Calif.	0.9s	4c	Union
	Watts, Calif. to Long Beach	10.0d	35c	Union
	Glendale, Calif.	0.4d	1c	Union
Penna.				
(E. Reg.)	Harrisburg, Pa. to Baltimore, Md.	81.5d	159p	Union
(W. Reg.)	Fourteen towns additional signals	....	14p	Union
(C. Reg.)	Dennison, Ohio to Newark	67.0d	110p	Union
	Yellow Creek, Ohio to Summitville	17.2s	24p	Union
	Vanport, Pa.	....	2p	Union
	Alliance, Ohio	....	2p	Union
	Emporium Jct., Pa. to M. P. 120	6.0s	1p	Union
	Cross Cut, Pa. to Edinburg.	4.2d	4s	Union
	Emporium Jct., Pa. to M. P. 121	2.0d	3p	Union
	Millvale, Pa. to Aspinwall	4.2d	8p	Union
	Fairhope, Ohio to Bayard	14.3d	28p	Union
	Oakdale, Pa. to Sturgeon	2.0s	2p	Union
	Huntley, Pa. to Sterling Run	5.0s	2p	Union
Reading	Womelsdorf, Pa. to Robesonia	7.3d	6c	Union
R. F. & P.	Doswell, Va. to "AF" Tower	97.0d	134c	.....
St. L.-S. F.	St. Louis, Mo. (Chouteau Ave.) to Tower Grove	1.1d	...	Union
S. A. L.	Richmond, Va. to Hamlet, N. C.	253.0s	25s 439c	Union Union
Southern	Asheville, N. C. to Craggy	5.0d	6c	General
	Craggy, N. C. to Morristown, Tenn.	82.0s	173c	General
	Roe Jct., Tenn. to New Line	3.0s	4c	General
	Dallas, Ga. to Austell	15.0s	28s	General
	Atlanta, Ga. to Macon	87.5s 6.0d	166s	General
	Seminary, Va. to Atlanta, Ga.*	628.5d	802c	General
C. N. O. & T. P.	Georgetown, Ky. to Lexington	11.5s	23s	General
	South Fork, Ky. to Kings Mountain	3.3s	6s	General
	Roddy, Tenn. to Boyce	60.0s	123s	General
	Danville, Ky. to Moreland	13.3d	25s	General
	Flat Rock, Ky. to Helenwood, Tenn.	30.0d	60s	General
	Oakdale, Tenn. to Harriman Jct.	5.7d	10s	General
A. G. S.	Waubatchie, Tenn. to Minvale, Ga.	42.4s	78s	.....
	Flanders, Ala. to Irondale	66.0s	110s	.....
	Vance, Ala. to York	88.3s	170s	.....
S. P. (Tex. & La.)	Cline, Tex. to Del Rio	50.3s	113L	Union
	Langtry, Tex. to Osman	9.1s	22L	Union
	Longfellow, Tex. to Marfa	80.2s	160L	Union
	Hearne, Tex. to Hammond	14.0s	33L	Union
	Bremond, Tex. to Mexia	37.6s	82L	Union
	Garrett, Tex. to Yard	0.5s	5L	Union
	Miller, Tex. to T. & P. Jct.	8.0s	19L	Union
	Sherman, Tex. to Yard	2.0s	L	Union
	Dorr Jct., Tex.	0.8s	3L	Union
S. P. (Pac. Sys.)	Deetz, Calif. to Klamath Falls, Ore.	100.9s	183c	Union
	Klamath Falls, Ore., to Springfield	174.7s	375L	Union
	Dome, Ariz. to Wellton	18.0d	36L	Union
	Emigrant Gap, Calif. to Andover	30.0d	60c	Union
U. P.	Echo, Utah to Gateway	25.8d	50L	Union
O. S. L.	Various passing track extensions	.. .	39L	Union
L. A. & S. L.	Los Angeles, Calif. to M. P. 4 to M. P. 9	0.5s	3c	Union
T. & P.	Marshall, Tex. to Longview Jct.	22.0s	36c	General
W. P.	M. P. 265, Calif.	0.8s	2L	Union
Wabash	Milan, Mich. to Britton	1.5s 8.5d	16c	Union
	Ennis, Mich. to Franklin	1.0s 17.5d	21c	Union
	Peru, Ind. to Logansport	11.0s	18s	Union
	Mardenia, Ind.	1.5s	2c	Union
	Huntington, Ind.	0.5s	1c	Union
	Gary, Ind.	0.5s	1s	Union
	Danville, Ill. to Tilton	4.0d	7s	Union
	Pement, Ill. to Decatur	1.5s 21.5d	4s 30c	Union
	Knights, Ill. to Boody	5.5d	2s 7c	Union
	Gallatin, Mo.	2.5s	4s	Union
	Carrollton, Mo. to Hardin	14.5s	11s	Union
	N. Kansas City, Mo.	0.5s	3s	Union
Totals		....	976L 2,307s	
		....		
		3,041.5s	5,413c	
		1,944.9d	638p	
		6.5t	460cp	
		4,992.9	6,511	

*Semaphore mechanisms replaced by color-light heads, therefore, new signals but not mileage figured in totals.

In "Miles of Road" column: s=single track, d=double track, t=three

In "No. of Signals" column: s=semaphore, L=lower quadrant semaphore, c=color-light, p=position-light, cp=color-position-light.

train stops permitted increased train loadings sufficient to produce a saving of $17,000 a year in operating expenses. The Chicago & North Western combined the functions of three mechanical interlockings into the control of one electrical machine, saving operating costs to the amount of $10,500 a year. Another road which has combined the control of two interlockings in one tower at several places, reports a saving of about $5,000 a year in each case. The Pennsylvania, the Chicago, St. Paul, Minneapolis & Omaha, and other roads have made changes of this kind.

The next step is the use of remote control for the operation of outlying switches, the control levers being located in an existing tower or in a telegraph office. A total of 50 such layouts were completed in 1926, including over 194 table levers in addition to the use of existing levers and 89 switch machines at outlying points. These layouts are provided to operate passing track, junction or yard switches to eliminate train stops, especially on grades. One installation on a southwestern

Table B—Automatic Block Signals—Under Construction, December 31, 1926

Road	Location	Miles of road	No. of signals	Manufacturer
A. C. L.	Folkston, Ga. to Waycross	33.3s	68s	Union
B. & O.	Huntingdon Ave. Md. to Mt. Royal Sta.	1.0f	4s 3cp	Union
	Camden, Md. to Bailey	0.7a	9ep	Union
	Orleans Rd., W. Va. to Okonoko	13.0d	22s	Union
C. of Ga.	Terra Cotta, Ga. to Carman	24.0s	...	.....
C. S. S. & S. B.	Smith, Ind. to South Bend	22.0s	33c	Union
I. R. T.	New York (149 St.) to 179 St.)	....	51p	.....
	New York (5th Ave.) to (8th Ave.)	....	6p	.....
L. I.	Lynebrook, N. Y. to Wreck Lead, N. Y.	3.3d	13c	Union
	Fremont St., N. Y. to New Lots	3.5f	13c	Union
L. & N.	Pascagoula, Miss. to Mobile, Ala.	39.5s	75s	General
M. P.	Washington, Mo. to Ettah	19.0d	...	.....
	Moreau River, Mo. to Jefferson City	3.3d	...	.....
N. C. & St. L.	Nashville, Tenn. to Cowan	80.5s 3.1d	185c	Union
N. Y. C.	Weehawken, N. J. to West Englewood, N. J.	12.0d	31c	Hall
	Suspension Bridge, N. Y. to Lockport	16.0d	33c	Hall
	Voorheesville, N. Y. to So. Schenectady	9.0d	26c	Hall
	Carson, Ohio to Dorset	10.7d	13s	General
	Latimer, Ohio to Brookfield	8.9d	12s	General
T. & O. C.	Berwick, Ohio to Stanley	37.0s 3.0d	85c	General
N. Y. C. & St. L.	Conneaut, Ohio to Arcadia	56.0s 114.0d	217c	Union
N. Y. N. H. & H.	Attleboro, Mass. to Sharon Hgt.	12.4d	24s	General
	Atlantic, Mass. to Braintree	4.6d	24c	Union
N. & W.	Roanoke, Va. to Winston-Salem, N. C.	119.1s	289p	Union
Penna.	Glassboro, N. J. to Newfield	12.0d	p	Union
(E. Reg.)	Paoli, Pa. to Downington	11.0f	p	Union
(C. Reg.)	Cleveland, Ohio to Woodland Ave.	5.0d	12p	Union
	Dennison, Ohio to Oakdale	75.0d	185p	Union
(W. Reg.)	Columbus, Ohio to Indianapolis, Ind.	46.0s 108.0d 24.0t	380p	Union
Southern	Asheville, N. C. to Biltmore	2.0d	4c	General
	Biltmore, N. C. to Majolica	134.0s	258c	General
	Majolica, N. C. to Salisbury	5.0d	7c	General
	Ooltewah, Tenn. to Dallas, Ga.	104.0s	194s	General
G. S. & F.	Macon, Ga. to Grand Crossing, Fla.	257.6s	446c	General
N. O. & N. E.	Meridian, Miss. to Hattiesburg	83.0s	165s	General
St. J. R. T.	Crand Crossing, Fla. to Jacksonville	3.0d	6c	General
S. A. L.	Savannah, Ga. to Jacksonville, Fla.	140.0s	233c	Union
	Jacksonville, Fla. to Baldwin	18.0s	39c	Union
S. P. (Tex. & La.)	Morgan City, La. to Berwick	3.0s	18L	Union
	Lake Charles, La. (Yard)	2.6s	1c	
	Sanderson, Tex. to Longfellow	16.0s	13L 34L	Union Union
(Pac. System)	Wellton, Ariz. to Picacho	124.5d	425L	Union
U. P.	Milford, Utah to Tomas	70.0s	121c	Union
L. A. & S. L.	Farrier, Nev. to Las Vegas	59.0s	109c	Union
O. S. L.	Dietrich, Idaho to Shoshone	7.3d	17L	Union
Wabash	Ennis, Mich. to Adrian	10.0d	15c	Union
Totals		....	1,899c	.....
		....	923p	.....
		....	12cp	.....
		....	2,834	.....
		1,344.6s	580s	.....
		584.7d	507L	.....
		24.0t		
		15.5f	1,087	.....
		1,968.8		

In "Miles of Road" column: s—Single track. d—Double track. t—Three tracks.

In "No. of Signals" column: s—Semaphore. L—Lower quadrant. c—Color-light. p—Position-light. cp—Color-position-light.

Table C—Automatic Block Signals Contemplated for 1927

Road	Location	Miles of road	No. of signals	Manufacturer
A. T. & S. F.	Lawrence, Kan. to Holliday	26.6d	...	Union
	Willow Springs, Ill. to Lockport	15.3d	...	Union
	Plaines, Ill. to Pequot	16.2d	22s	Union
	Newkirk, Okla. to Oklahoma City	108.2s	140s	Union
	Burton, Kan. to Hutchinson	10.0d	16s	Union
	Morse, Colo. to Casa, Kan.	54.0s	92s	Union
	Avard, Okla. to Waynoka	11.0d	13s	Union
	Pampa, Tex. to Canyon	71.4d	100s	Union
	Bellville Yard, Tex. to Somerville	35.1s	62s	Union
	Cleburne, Tex. to Birds	25.3s	40s	Union
	Riverside, Calif. to Corona	14.3s	32c	Union
	Belen, N. M. to Dalies	10.3s	13c	Union
	Winslow, Ariz. to Defiance, N. M.	119.9d	120c	Union
	Cotton, Calif. to Riverside Jct.	6.0d	14c	Union
	Hobart, Calif. to Fullerton	19.3s	38c	Union
	Landco, Calif. to Angiola	52.3s	85s	Union
	Landco, Calif. to Oil Jct.	3.2s	7s	Union
B. & O.	Cincinnati, Ohio to Dearborn, Ind.	20.0d	47cp	Union
	Cochran, Ind. to Milan	15.2d	...	.....
	Shattuc, Ill. to E. St. Louis	4.3s 50.0d	...	.....
	Grafton, W. Va. to Parkersburg	87.5s 14.5d	...	.....
	Newark, Ohio to Columbus	33.2d	...	.....
	Akron Jct., Ohio to Warwick	15.6d	...	.....
C. of Ga.	Columbus, Ga. to Trammells, Ala.	93.0s	...	.....
	Sylacauga, Ala. to Vandiver	26.0s	...	.....
D. L. & W.	Elmira, N. Y. to Binghamton	57.0d	93c	Union
G. N.	St. Paul, Minn. to Minneapolis	10.0d	c	.....
I. & N.	Flanagan, Ky. to Ophelia	12.5d	26s	Union
	Conway, Ky. to Sinks	12.0d	28s	Union
	Lebanon Jct., Ky. to Elizabethtown	14.0d	33s	General
M-K-T	Eureka, Tex. to Houston	5.0s	19c	Union
	Clinton Yards, Mo.	2.0s	4s	Union
	Waxahachie Yards, Tex.	4.0s	6s	Union
	Dallas, Tex. to Sargent	2.0s	2s	Union
N. Y. O. & W.	Fulton, N. Y.	3.2s	12c	.....
N. & W.	Bluefield, Va. to Norton	100.4s	282p	Union
N. P.	Logan, Mont. to Whitehall	39.0s	44s	General
	Butte, Mont. to Silver Bow	7.0s	13s	General
T. & P.	Texarkana, Tex. to Marshall	67.0s	98c	.....
	Dallas, Tex. to Ft. Worth	31.0s	46c	.....
	Ft. Worth, Tex. to Hodge	6.5s	16c	.....
U. P.	Denver, Colo. to Limon	88.2s	176L	Union
	Junction City, Kan. to Salina	45.0s	...	.....
	Pullman, Colo. to Borie, Wyo.	101 0s	...	.....
	Spear, Wyo. to Corlett Jct.	....	...	.....
O. S. L.	Fort Hall, Idaho to Idaho Falls	37.2s	94L	Union
L. A. & S. L.	Lynndyl, Utah to Milford	90.0s	162c	Union
	Las Vegas, Nev. to Daggett, Cal.	176.0s	317c	Union
Wabash	Adrian, Mich to Britton	10.0d	4s 19c	Union
	Franklin, Ohio to Montpelier	2.0s 13.0d	24c	Union
	N. Liberty, Ind. to Lakeville	6.0s	8s	Union
	Riverside, Ind. to West Point	2.0s	2s	Union
	Lafayette, Ind. to Buck Creek	2.0s	2s	Union
	Peru, Ind. to Huntington	26.0s	27c	Union
	Staunton, Ill. to Mitchell	22.0d	36c	Union
	Litchfield, Ill. to Mt. Olive	5.0d	8s	Union
	Chicago (75th St.) to Orland, Ill.	2.0s 13.0d	28c	Union
	St. Louis, Mo. to Glen Echo	3.0s	8c	Union
	Mitchell, Ill. to Granite City	7.5d	13c	Union
	Jacksonville, Ill. to Bluffs	21.0s	30c	Union
	Huntsville, Mo. to Salisbury	14.0s 1.5d	24c	Union
	Carrollton, Mo. to Brunswick	24.0s 1.5d	30c	Union
Totals		....	1,219c	.....
		....	282p	.....
		....	47cp	.....
		....	1,548	.....
		1,435.7s	757s	.....
		604.8d	270L	.....
		2,040.5	1,027	.....

In "Miles of Road" column: s—Single track. d—Double track. t—Three tracks.

In "No. of Signals" column: s—Semaphore. L—Lower quadrant. c—Color-light. p—Position-light. cp—Color-position-light.

road is saving $7,000 a year in operating costs and a saving of $10,000 is reported for another single installation. One remote control switch machine installation saved 40 minutes' time for the first train that used it within an hour after it was placed in service.

Automatic Interlockings Increase Rapidly

Unique in railway signaling on steam roads is an installation of an automatic interlocking placed in service recently at Minot, N. D., on the Great Northern, in which the operation of a switch at the end of a double track is controlled by high-speed approaching trains on the single track or either track of the double track. This installation dispensed with switch tenders on three shifts. The New York Rapid Transit has five automatic interlockings including switches at terminals or junctions where the operation of the switches is controlled by approaching trains.

In 1926, a total of 22 installations of automatic signaling protection were made at railroad grade crossings to replace regular interlockings requiring the attendance of levermen. It was reported that between 75 and 80 of these plants are now in service and at least this many more are planned for installation in the near future. The Great Northern has 36 automatic signaling plants in service at crossings and junctions. Several roads report savings of from $4,500 to $6,000 made possible by each automatic signaling interlocking which replaced a mechanical plant where levermen were employed three tricks.

A number of these so-called automatic signaling interlockings have been installed in Minnesota and North Dakota where the state commissions have required smash-boards on the home signals, whereas such plants are operating quite successfully without smash-boards in Iowa, South Dakota, and Quebec.

In answer to our questionnaire 22 signal officers opposed the use of smash-boards on the home signals at these automatic interlockings, because of the added complication. In their opinion the smash-board does not prevent a collision at the crossing but is merely a telltale to indicate which engineman might have been at fault in over-running the home signal. Six signal engineers favor the use of smash boards, contending that such a device serves as a check and will be effective in securing observance of signal indications.

Car Retarders Tested Extensively

Car retarder installations were placed in service during 1926 at three yards on the Illinois Central, at two yards on the Indiana Harbor Belt and at one yard on the New York, New Haven & Hartford. A small layout of car retarders was also installed by the Commonwealth Edison Company at one of its power plants in Chicago to assist in handling coal cars. The Illinois Central installations have been in service since March and have been inspected by representatives of numerous roads, the consensus of opinion being that the car retarder system is a success and that it has accomplished all that was expected in reducing the cost of classifying cars at hump yards and in preventing damage to cars and lading. The railroads and manufacturers have made detailed studies of the grades required for tracks where

Table D—Interlocking Plants Completed During 1926

Road	Location	Working levers: Mechanical	Electrical	Electro-Pneumatic	Elect.-mech.: Mech.	Elect.
A. C. L.	Ashley Jct., S. C.	..	..	22	..	..
	Yukon, Fla.	..	..	..	4	4
	Orange City Jct., Fla.	..	..	..	3	3
	Panama, Fla.	10	..	..	..	..
	Baldwin, Fla.	..	..	..	11	2
	Lake Monroe, Fla.	..	..	..	4	4
	Lake Monroe, Fla.	4	..	..	..	..
	Albany, Ga.	..	..	..	12	4
	Albany Yard, Ga.	..	..	..	11	4
	Darrow, Ga.	6	..	..	..	..
	Rocky Mount, N. C.	5	..	..	..	..
	Platt, Fla.	8	..	..	..	..
A. T. & S. F.	Turner, Kan.	..	42	..	..	..
B. & L. E.	Branchton, Pa.	..	..	..	23	9
C. N.:						
West Reg.	Delta Jct., Man.	4	..	..	..	..
	Winnipeg, Man.	2	..	..	..	..
	Winnipeg, Man.	3	..	..	..	..
C. R. R. of N. J.	Newark Bay Draw, N. J.	..	..	37	..	..
	Bayonne, N. J.	..	..	36	..	..
	Elizabethport, N. J.	..	..	27	..	..
C. & O.	Clifton Forge, Va.	..	..	..	4	2
	Clifton Forge, Va.	..	..	24	..	..
C. & E. I.	Coaler, Ill.	17	..	..	..	..
C. & N. W.	New Butler, Wis.	..	45	..	..	..
	Staunton, Ill.	24	..	..	..	..
	California Jct., Ia.	..	3	..	..	..
C. & W. I.	Chicago	..	..	14	..	..
C. R. I. & P.	Jones, Kan.	10	3	..	..	..
C. N. S. & M.	Skokie, Ill.	..	26	..	..	..
	South Upton, Ill.	..	45	..	..	..
D. L. & W.	Secaucus Jct., N. J.	13	..	..	..	..
	E. E. Binghamton, N. Y.	..	..	2	..	..
	Kearney Jct., N. J.	..	..	1	..	..
	Dover, N. J.	1	..	..	..	..
Erie	Paterson, N. J.	..	40	..	..	..
F. E. C.	Jacksonville, Fla.	..	8	..	..	..
	So. Jax., Fla.	..	16	..	..	..
	St. Augustine, Fla.	..	16	..	..	..
	Bunnell, Fla.	..	12	..	..	..
Ft. W. & R. G.	Ft. Worth, Tex.	6	..	..	..	..
G. N.	Hillyard, Wash.	15	..	..	..	..
I. C.	Chicago (51st St.)	..	30	..	..	..
	Chicago (67th St.)	..	110	..	..	..
	Burnside, Ill.	..	..	..	9	4
I. R. T.	New York (5th Ave.)	..	..	5	..	..
L. V.	Easton, Pa.	..	60	..	..	..
	Athens, Pa.	..	19	..	..	..
	Green Bridge, N. J.	4	7	..	..	..
L. I.	Great Neck, N. Y.	8	..	..	..	..
	Freeport, N. Y.	18	..	..	..	..
	Flushing, N. Y.	3	..	..	..	..
	Flushing, N. Y.	3	..	..	..	..
	Douglaston, N. Y.	3	..	..	..	..
L. & N.	Baxter, Ky.	..	..	..	4	5
M. P.	Benton, Ark.	24	..	..	4	..
	Ford, Ill.	14	..	..	4	..
M. & O.	Montgomery, Ala.	..	28	..	..	..
N. Y. C.	Suspension Bridge, N. Y.	..	131	..	..	..
	Palmyra, N. Y.	53	..	..	..	..
	Genesee Jct., N. Y.	..	10	..	..	..
	Nasby, Ohio	..	59	..	..	..
M. C.	Detroit, Mich.	..	7	..	..	..
P. & L. E.	Beaver Falls, Pa.	..	32	..	..	..
N. Y. C. & St. L.	South Gary, Ind.	..	7	..	..	..
	Thomaston, Ind.	12	..	..	..	..
	S. Whitley, Ind.	..	..	..	16	7
N. Y. N. H. & H.	E. Hartford, Conn.	24	..	..	..	..
Pacific Elec.	Los Angeles, Calif.	..	7	..	..	..
Penna.:						
(E. Reg.)	York, Pa.	..	..	18	..	..
	Overbrook, Pa.	..	..	14	..	..
(C. Reg.)	Genesee Jct., N. Y.	..	12	..	..	..
	Monongahela, Pa.	..	..	..	9	14
	New Brighton, Pa.	..	..	..	12	16
(W. Reg.)	So. Whitley, Ind.	..	..	..	..	7
	Brownstown, Ill.	..	..	..	5	7
	Pierron, Ill.	..	..	..	7	8
	Walbridge, Ohio	..	..	39	..	..
Reading	Birdsboro, Pa.	..	..	30	..	..
St. L.-S. F.	Pleasanton, Kan.	17	..	..	..	..
S. A. L.	Rocketts, Va.	..	..	..	2	3
	Bonsal, N. C.	4	..	..	..	..
	Winter Haven, Fla.	..	..	..	12	6
	Fairfax, S. C.	..	..	..	10	8
	Denmark, S. C.	..	..	..	16	11
	Everett, Ga.	..	..	..	9	3
	Mabel, Fla.	..	..	..	8	3
	Mullins, S. C.	14	..	..	..	..
Southern	Sigsbee, S. C.	4	..	..	..	..
	Boyles, Ala.	21	..	..	..	..
	Seven Mile, S. C.	..	..	22	..	..
S. P.: (Pac. Sys.)	Pacific Jct., Alameda, Calif.	..	11	..	..	..
	Summit, Calif.	..	45	..	..	..
(Tex. & La.)	Dallas, Tex.	..	43	..	..	..
	Metzger, Tex.	..	33	..	..	..
	Rosenberg, Tex.	..	2	..	..	..
	Eagle Lake, Tex.	..	3	..	..	..
T. & P.	Grand Saline, Tex.	4	..	..	..	..
	Ranger, Tex.	9	..	..	..	..
	Cut Off Jct., La.	11	3	..	..	..
	Zimmerman, La.	1	1	..	..	..
	Terrell, Tex.	..	10	..	..	..
Totals	New Plants	36	34	14	23	22
	New Levers	379	926	291	199	134
	Rebuilt, not listed in table: Plants	27	18	8	17	44
	Rebuilt, not listed in table: Levers	217	146	37	59	277

Car Retarder Installations Completed During 1926

Road	Location	No. of Classification Tracks	No. of Towers	No. of Retarder Mechanisms	No. of Retarders	Track Ft. Retarders Double	Track Ft. Retarders Single	No. of Power Switches	No. of Switch Signals	No. of Power Skates	Manufacturer
Edison Co.	Chicago	4	1	1	2	32					Union
I. C.	E. St. Louis, Ill.	26	4	52	52	1683	33	28	28	26	General
	Markham Yd., S. B.	44	4	80	80	2445	132	46	46	44	General
	Markham Yd., N. B.	67	5	121	121	3408	256	69	69	65	Union
I. H. B.	Blue Island, Ill.	30	5	51	65	2185	201	34	0	0	General
	Gibson, Ill., S. B.	30	2	29	29	840	200	32	32		Union
N. Y. N. H. & H.	Hartford, Conn.	24	2	33	33	1089	0	24	0	24	General
Totals		225	23	367	382	11682	882	223	408	159	

retarders are to be used. With this data, together with nearly a year's experience in operation, it is expected that several other roads will proceed to install car retarders in 1927.

Table E—Interlocking Plants Under Construction, December 31, 1926

Road	Location	Working levers: Mechanical	Electrical	Electro-Pneumatic	Elect.-mech. Mech.	Elect.-mech. Elec.
A. C. L.	Drifton, Fla.	16	..	..	..	..
	Dunnellon, Fla.	..	..	..	5	8
C. R. R. of N. J.	East Penn. Jct., Pa.	..	..	45	..	..
C. & O.	Gauley, W. Va.	..	..	..	12	6
I. R. T.	New York (149th St.)	..	..	24	..	..
	(164th St.)	..	..	11	..	..
	(111th St.)	..	..	60	..	..
	(Willets Pt.)	..	..	3	..	..
	(Flushing)	..	..	11	..	..
	(7th Ave.)	..	..	7	..	..
L. I.	Wreck Lead, N. Y.	9	..	..	..	..
	Powells Creek, N. Y.	3	..	..	..	..
	Fremont St., N. Y.	..	..	23	..	..
	New Lots, N. Y.	..	..	23	..	..
	New Utrecht Ave., N. Y.	18	..	..	..	..
L. & N.	Elizabethtown, Ky.	..	..	..	4	7
M. P.	Bryant, Ark.	15	..	..	..	..
	Belt Jct., Mo.	..	..	..	4	..
	New Augusta, Ark.	5	..	..	3	..
N. Y. C.	Weehawken, N. J.	..	80	..	..	..
	New Durham, N. J.	..	80	..	..	..
	Little Ferry, N. J.	..	80	..	..	..
O. C. O.	Stanley, Ohio	..	113	..	..	..
M. C.	Hammond, Ind.	..	8	..	..	..
	Union City, Ind.	..	*	..	..	..
	Riverside, Ohio	..	*	..	..	..
	Sedamsville, Ohio	..	*	..	..	..
	E. Sharon, Ohio	..	..	..	..	*
B. & A.	Springfield, Mass.	..	185	..	..	..
N. Y. C. & St. L.	S. Wanatah, Ind.	16	..	..	..	..
	North East, Pa.	..	..	..	8	2
Pac. Elec.	Clearwater, Calif.	12	..	..	..	..
	Bell, Calif.	19	..	..	..	..
Penna.:						
(E. Reg.)	Bayview, Md.	..	..	26	..	..
(C. Reg.)	Bayard, Ohio	..	..	39	..	..
	R. D. Tower, Ohio.	..	..	..	8	10
	Weirton Jct.	..	..	43	..	..
	Broadacre, Ohio	..	..	..	8	11
	Mingo Jct., Ohio.	..	..	..	10	17
	Conesville, Ohio	..	..	..	10	12
(W. Reg.)	Greenville, Ind.	..	..	..	7	11
	Jewett, Ill.	..	..	..	8	10
	Richmond, Ind.	..	..	8	..	..
S. A. L.	Ft. Myers, Fla.	12	..	..	..	..
	Drexel, Fla.	8	..	..	..	..
	Gilchrist, Fla.	8	..	..	..	..
	Crawford, Fla.	..	..	..	10	2
	Hampton, Fla.	17	..	..	..	..
	Baldwin, Fla.	..	10	..	..	..
	Miami, No. 1, Fla.	..	5	..	..	..
	Miami Canal, Fla.	4	..	..	..	..
	Comfort Canal, Fla.	4	..	..	..	..
	Imperial River, Fla.	4	..	..	..	..
	Caloosahatchie, Fla.	4	..	..	..	..
	Hillsboro, Fla.	4	..	..	..	..
	Satilla River, Ga.	..	..	..	4	2
	Altamaha River, Ga.	..	..	..	4	2
	St. Marys River, Ga.	..	..	..	4	2
	Ogeechee River, Ga.	..	..	..	4	2
	Trout Creek, Ga.	..	..	..	4	2
	Jacksonville, Fla.	..	..	..	3	2
	Taconey, Fla.	8	..	..	..	..
Southern	Biltmore, N. C.	19	..	..	..	..
G. S. & F.	Stratton, Ga.	20	..	..	..	..
A. Gt. S.	Wauhatchie, Tenn.	..	32	..	..	..
U. P.	Summit (Omaha), Neb.	..	23	..	..	..
	Bonner Springs, Kan.	..	13	..	..	..
Wabash	Detroit, Mich. (Rouge River)	..	19	..	..	..
	So. Adrian, Mich.	..	..	..	..	3
Totals	New: Plants	22	13	12	17	12
	New: Levers	225	674	315	105	40
	Rebuilt, not listed in table: Plants	3	5	..	5	34
	Rebuilt, not listed in table: Levers	33	32	..	48	257

*Number levers not shown.

Increased Interest in Spring Switches

For about 10 years the Atchison, Topeka & Santa Fe has been developing a type of spring switch, which includes an oil buffer to prevent the switch from pounding as each set of trucks trails through the switch points. However, it was not until 1926 that such installations were made extensively enough so that spring switches could be considered acceptable practice on many roads. Recent reports indicate that 10 roads now have a total of over 50 spring switches in service. The Chicago & North Western has about 20 spring switches and the

Table F—Interlocking Plants Contemplated for 1927

Road	Location	Working levers: Mechanical	Electrical	Electro-Pneumatic	Elect.-mech. Mech.	Elect.-mech. Elec.
A. T. & S. F.	Girard, Kan.	24	..	..	..	..
	Augusta, Kan.	..	..	..	48	8
	Amarillo, Tex.	..	54	..	..	..
	Ballinger, Tex.	4	..	..	..	..
	Tuscola, Tex.	6	..	..	..	..
I. R. T.	New York (142d St.)	..	..	23	..	..
	Pelham Yard, N. Y.	..	..	71	..	..
K. C. S.	Kansas City, Mo.	1	..	..	..	..
	Richards, Mo.	20	..	..	..	..
	Gulfton, Mo.	20	..	..	..	..
N. Y. C.						
C. C. C. & St. L.	Lippincotts, Ohio.	..	..	..	17	6
	Glen Echo, Ohio	..	..	..	10	6
R. F. & P.	Doswell, Va.	..	..	*	..	..
T. & P.	Big Sandy, Tex.	..	16	..	..	..
	H. & S. Crossing, La.	..	12	..	..	..
Wabash	Albia, Ia.	..	10	..	..	..
U. P.	Topeka, Kan.	..	75	..	..	..
	Manhattan, Kan.	..	39	..	..	..
L. A. & S. L.	Long Beach, Calif.	..	6	..	..	..
Totals	New: Plants	6	8	2	3	3
	New: Levers	75	224	94	75	20
	Rebuilt, not listed: Plants	2	2	1	0	0
	Rebuilt, not listed: Levers	6	47	8	0	0

* Indicates type of machine.

Table G—Special Equipment at Outlying Points Installed in 1926

Road	Location	Automatic Signaling: Layout	Automatic Signaling: Interlocking	Remote Control: Desk Levers	Remote Control: Switch Machines
A. C. L.	Lanes, S. C.		....	4	..
A. T. & S. F.	Emporia, Jct., Kan.	Jct.	....	..	2
	Elllnor, Kan.	Jct.	....	..	4
	Ottuwa, Jct.	Jct.	....	..	2
	Marceline, Mo.	Yd.	....	6	2
	Bazar, Kan.	P.T.	....	4	2
	Aikman, Kan.	P.T.	....	4	2
	Henrietta, Mo.	P.T.	....	2	1
	Cicero, Kan.	P.T.	....	1	1
C. & O.	Clifton Forge, Va.	Hump.	....	3	..
C. M. & St. P.	Rodney, Ia.	Xing.	Yes	..	..
	Delmar, Ia.	Xing.	Yes	..	..
	Aberdeen, S. D.	Xing.	Yes	..	..
	Redfield, S. D.	Xing.	Yes	..	..
	Wolsey, S. D.	Xing.	Yes	..	..
	Stockland, Ill.	Xing.	Yes	..	..
	Indian Creek, Ia.	Jct.	....	4	3
C. N.	Lazard, Que.	Jct.	....	2	..
	Granby, Que.	Jct.	....	1	..
	Red Bank, Ont.	Jct.	....	4	1
C. of G.	Ft. Valley, Ga.	Jct.	....	6	3
C. P.	Whitewood, Sask.	Jct.	....	2	1
	Montreal, West, Que.	Jct.	....	..	3
C. R. I. & P.	Laurens, Ia.	Xing.	Yes	..	..
	Wabash, Mo.	Xing.	....	2	..
	Cedar Rapids, Ia.	Xing.	....	6	1
C. St. P. M. & O.	Eau Claire, Wis.	Br.	....	4	..
	Bl. Riv. Falls, Wis.	Br.	....	4	..
D. T. & I.	Petersburg, Mich.		Yes	..	..

Road	Location	Layout	Automatic Signaling Interlocking	Remote Control Desk Levers	Remote Control Switch Machines
F. E. C.	Jacksonville, Fla.	Dr. Bd	....	..	1
	Jacksonville, Fla.	Jct.	....	..	5
	St. Augustine, Fla.	Jct.	....	..	3
	Bunnell, Fla.	Jct.	....	..	3
	Stuart, Fla.	Dr. Br.	....	3	1
	Jupiter, Fla.	Dr. Br.	....	3	1
	Ardley, Fla.	Dr. Br.	....	3	2
	Ft. Lauderdale, Fla.	Dr. Br.	....	3	1
G. N.	Surrey, N. D.	Jct.	....	6	5
	Minneapolis, Minn.	Jct.	....	2	..
	Redland, Minn.	Xing.	Yes	..	..
	Wadena, Minn.	Xing.	Yes	..	..
	Huron, S. D.	Xing.	Yes	..	..
	Davis, S. D.	Xing.	Yes	..	..
	Norfolk, N. D.	Xing.	Yes	..	..
	New Rockford, N. D.	Xing.	Yes	..	..
	Minot, N. D.	E.D.T.	Yes	..	2
L. I.	Great Neck, N. Y.	Jct.	....	2	..
	Whitestone Jct.	Jct.	....	5	..
	Whitestone Ldg.	Term.	....	2	..
	Pt. Washington.	Term.	....	2	..
L. V.	Wilkes-Barre, Pa.	Xing.	....	3	..
M-K-T	Bellmead, Tex.	Jct.	....	2	1
M. P.	Benton, Ark.	E.D.T.	....	..	1
	Ford, Ill.	E.D.T.	....	..	2
	Halsey, Ill.	E.D.T.	....	..	1
	Independence, Mo.	E.D.T.	....	1	1
N. C. & St. L.	Glencliff, Tenn.	Jct.	....	2	1
N. P.	Bozeman, Mont.	....	....	..	2
	Anglim, Minn.	Xing.	Yes	..	..
	Fergus Falls, Minn.	Xing.	Yes	..	..
	Sauk Centre, Minn.	Xing.	Yes	..	..
	Elk River, Minn.	Jct.	Yes	..	..
	Minneapolis, Minn.	Xing.	Yes	..	..
N. Y. C.	Corunna, Ind.	Sid.	....	3	1
	Kendalville, Ind.	P.T.	....	3	1
	Brimfield, Ind.	P.T.	....	3	1
	South Bend, Ind.	P.T.	....	3	1
	Porter, Ind.	....	....	4	1
C. C. C. & St. L.	Tower Hill, Ind.	....	....	2	3
N. Y. C. & St. L.	S. Whitley, Ind.	Xing.	....	..	1
N. Y., N. H. & H.	Attleboro, Mass.	Jct.	....	..	3
Pennsylvania	Ft. Wayne, Ind.	Xing.	....	9	..
	Auburn, Pa.	Outly.	....	6	..
	Leesport, Pa.	Outly.	....	7	..
Reading	Robesonia, Pa.	....	....	3	3
R. F. & P.	Doswell, Va.	....	....	..	2
	K N Tower	....	....	..	2
	W H Tower	....	....	..	2
S. A. L.	Rocketts, Va.	Jct.	....	3	..
S. P.	Dallas, Tex.	Xing.	....	..	2
	Metzger, Tex.	Xing.	....	..	2
	Rosenberg, Tex.	P.T.	....	..	1
	Eagle Lake, Tex.	P.T.	....	..	1
	Redding, Calif.	Jct.	....	2	..
	Summit, Calif.	Jct.	....	..	4
	Wellton, Ariz.	Jct.	....	9	..
	Mescal, Ariz.	Jct.	....	18	..
Wabash	Gary, Ind.	E.D.T.	....	2	1
	Salisbury, Mo.	Xing.	....	2	..
W. & L. E.	Bedford, Ohio.	....	Yes	..	..
Totals			21	154	92

Union Pacific 12, while the Chicago, Burlington & Quincy, the Missouri Pacific, the Central of Georgia, the Canadian National, the Northern Pacific and several other roads report two or more installations.

Table H—Special Equipment at Outlying Points Under Construction, December 21, 1926

Road	Location	Layout	Automatic Signaling Interlocking	Remote Control Desk Levers	Remote Control Switch Machines
C. B. & Q.	Albia, Ia.	Jct.	....	4	..
C. R. I. & P.	Faribault, Minn.	Xing.	Yes	..	..
M. P.	New Augusta, Ark.	Dr. Br.	....	..	1
N. Y. C.	Lydic, Ind.	Sid.	....	3	1
N. Y. C. & St. L.	Dunkirk, N. Y.	Xing.	....	3	..
S. A. L.	Miami, Fla.	Xing.	....	2	..
S. P.	Emigrant Gap, Cal.	Jct.	....	3	..
Wabash	S. Adrian, Mich.	Xing.	....	..	1
Pennsylvania	Jewett, Ill.	....	....	..	2
	Greenville, Ohio.	Xing.	....	..	1
	Bayard, Ohio.	Xing.	....	..	34
	St. Marys, Pa.	E.D.T.	....	4	1
	Broadacre, Ohio.	Outly.	....	..	6
	Mingo Jct.	Outly.	....	..	6
	Frazeyburg, Ohio.	Outly.	....	..	4
	Weirton Jct., W. Va.	....	....	..	10
	Conesville, Ohio.	Xing.	....	..	4
Totals			1	19	71

The spring switch has been found satisfactory for switches at the leaving ends of yards, at the ends of double track, and at passing sidings where the speed is limited by grade or by rule to 20 miles and in some cases 25 miles an hour for any train over the switch. Automatic signal protection is provided for movements over these switches and one road has seen fit to place no special limits on speed, it being the conclusion that its operation is as safe as any other switch in non-automatic block territory. Where train stops are eliminated regularly by the use of these special devices, a decided saving is made. In one case on the Union Pacific a spring

Table I—Special Equipment at Outlying Points Contemplated for 1927

Road	Location	Layout	Automatic Signaling Interlocking	Remote Control Desk Levers	Remote Control Switch Machines
A. T. & S. F.	Augusta, Kan.	Xing.	....	..	3
	Rosenberg, Tex.	Jct.	....	2	1
	Brownwood, Tex.	Jct.	....	2	1
	Ardmore, Okla.	Jct.	....	4	2
C. & N. W.	West Nelson, Ill.	Jct.	....	11	..
C., R. I. & P.	Washington, Ia.	Xing.	Yes	..	..
	DeValls Bluff, Ark.	....	....	1	..
G. N.	Ardley, B. C.	Xing.	Yes	..	..
	Hutchinson, Minn.	Xing.	Yes	..	..
	Appleton, Minn.	Xing.	Yes	..	..
K. C. S.	Fuller, Kan.	Xing.	Yes	..	..
	Poteau, Okla.	Xing.	Yes	..	..
	Howe, Okla.	Xing.	....	4	..
L. A. & S. L.	San Pedro, Calif.	Xing.	Yes	..	..
M-K-T	Eureka, Tex.	Jct.	....	1	1
N. P.	Fargo, N. D.	Xing.	Yes	..	..
N. Y. C.	Charleston, Ill.	Xing.	....	1	1
N. Y., O. & W.	Fulton, N. Y.	Jct.	....	1	..
S. P.	Picacho, Ariz.	Jct.	....	4	..
Wabash	Adrian, Mich.	....	....	2	1
Totals			8	33	10

Table J—Automatic Highway Crossing Protection

Road	Automatic Highway Crossing Signals: Installed 1926 Wig-Wag	Installed 1926 Flash-Light	Under Construction Wig-Wag	Under Construction Flash-Light	Contemplated Wig-Wag	Contemplated Flash-Light
A. & W. P.	2	...	...	...	...	...
A. T. & S. F.	53	...	8	...	12	...
B. & O.	...	97	...	40	...	...
C. N.	16	59	...	5	...	...
C. P.	6	...	...	...	...	...
C. & O.	1	25	...	12	...	...
C. B. & Q.	30	...	...	...	...	...
C. G. W.	...	25	...	...	...	...
C. M. & St. P.	25	4	...	...	...	...
C. St. P. M. & O.	4	...	...	...	1	...
C. S. S. & S. B.	1	...	...	...	...	...
C. & E. I.	...	13	...	...	...	...
C. I. & L.	...	9	...	...	...	10
C. R. I. & P.	...	27	...	...	...	...
C. & N. W.	145	...	...	...	...	...
D. L. & W.	...	37	...	37	...	60
F. E. C.	...	10	...	...	...	...
I. C.	7	27	...	...	...	...
K. C. S.	1	...	1	...	10	...
L. V.	...	7	...	...	...	...
L. & N.	17	6	9	4	...	...
M.-K.-T.	15	...	...	...	...	...
M. P.	10	...	...	...	...	...
M. & O.	1	...	...	...	...	...
N. C. & St. L.	...	...	...	48	...	...
No. Ohio	15	...	...	...	...	...
N. P.	47	1	20	...	...	...
N. & W.	7	...	8	...	9	...
N. Y. O. & W.	...	...	...	...	...	13
N. Y. C.	...	72	...	103	...	...
O. C.	...	28	...	...	...	...
M. C.	...	57	...	...	...	...
C. C. C. & St. L.	...	27	...	...	...	...
P. & L. E.	...	4	...	...	...	...
N. Y. C. & St. L.	...	...	...	...	...	...
N. Y. N. H. & H.	...	12	...	17	...	...
Oahu Ry. & L.	...	2	...	5	...	2
Penn.	2	226	...	84	...	...
P. E.	57	...	20	...	...	...
P. & P. U.	...	2	...	...	...	...
P. S. & N.	...	1	...	...	...	...
P. M.	...	...	...	...	...	...
Reading	...	112	...	9	...	40
St. L.-S. F.	9	...	...	...	...	...
S. A. L.	...	4	...	...	...	...
Southern	...	12	...	...	...	...
C. N. O. & T. P.	...	1	...	...	...	...
N. O. & N. E.	...	2	...	...	...	...
S. P. (Pac. Sys.)	58	...	...	...	...	...
(L. & T.)	28	...	...	...	...	...
T. & P.	4	...	18	5	...	...
U. P.	3	...	...	7	...	...
L. A. & S. L.	16	...	...	...	17	...
St. J. & G. I.	1	...	...	...	...	...
Wabash	1	10	...	4	...	...
Totals	582	919	84	373	65	125

switch saved $3,000 a year, and a spring placed on a switch at the leaving end of a yard on the Chicago & North Western allowed an increase in train loadings that saved $5,000 a year. This road has several passing tracks, both on single and double track, equipped with springs which are operating satisfactorily.

Highway Crossing Protection Presents Problems

Because of the increasing automobile traffic the railroads have a serious problem to provide protection at highway crossings that is adequate and yet not of excessive cost. A total of 1,560 automatic highway crossing signals were installed on the roads in Canada and the United States during 1926. Of these 583 were the wig-wag and 977 of the flashing-light type.

The Public Service Commission of the state of New York requires the flashing-light signal, while Wisconsin, Nebraska, Wyoming and California prefer the wig-wag. The majority of the remaining states have requisites that can be met by either the wig-wag or flashing light, although several states show certain preferences. Roughly speaking, the majority of the automatic highway crossing signals being installed east of Chicago are the flashing-light type, while the majority of those west of that city are wig-wags.

Where highway traffic is exceedingly heavy, gates are in some cases inadequate on account of the inability to lower them without damage to automobiles and they must be supplemented by flagmen on the ground if used. Numerous roads have, therefore, replaced gates with wig-wags or flashing-light signals. Three roads alone report a total of 60 such changes in a year. Not only is better protection afforded for the full 24 hours by the signals but the number of men required for operation has been reduced so as to save $108,895 annually, averaging about $1,750 annually for each crossing where the gates have been replaced by wig-wags or flashing lights. Many automatic signals were installed at crossings where gates or other protection had been considered.

Considerable controversy has arisen as to whether the automatic signal should be in the center of the street or at the curb. Where the paving is over 26 ft. wide and the local authorities relieve the railroad from damages to automobiles occasioned by driving cars into the foundation, a total of 22 signal engineers out of 34, state a preference for the center location.

The several state commissions have not issued any definite ruling but reports indicate that several desire the center-of-street location while New Jersey and Pennsylvania will not approve of such an installation. The summary of the situation is that the location depends entirely on local conditions and the prevailing practice as to the location of street traffic signals.

Good Prospects for 1927

At least 20 roads have definitely decided on their signaling programs for 1927. Signaling is to be provided on 1,436 miles of single track and 605 miles of double track. In addition one road is known to have authorized the installation of signals on 100 miles of line and another has contracted for a ninety-mile installation. Therefore, it may be expected that at least 3,000 miles of road will be equipped with automatic signals during 1927.

Fifty-two interlocking plants are planned for 1927. The Santa Fe is to install a 54-lever electrical plant, the Union Pacific a 75-lever electric plant, and the Interborough Rapid Transit a 71-lever electro-pneumatic plant. Nine automatic signaling plants are planned for railroad crossings.

While no announcement has yet been made of the 1927 budgets by many roads, it is certain that numerous other installations will be included in their 1927 programs. In view of the increased interest in the reduction of operating costs made possible by signal and interlocking installations a large variety and volume of such installations are planned. Practically all of the roads report bright prospects for expenditures and it is believed that signal and interlocking installations for 1927 will equal or even exceed the record year of 1926.

On the Union Pacific at Ogden, Utah

Rapid Progress in Automatic Train Control in 1926

Active construction program closes year with all but five installations under first order in service and 23 roads with second division complete

Train Control Insures Compliance with Indications of Wayside Signals at Meeting Points

THE train control situation in 1926 represented the benefits of years of study, invention, legislation and development, for about 50 per cent of the installations required under the first order of the Interstate Commerce Commission were actually placed in service during the year just closed as were also 23 of the 36 installations on which the second order is now effective. Train stop or train control is now in operation on over 11,145 miles of tracks with about 4,550 locomotives, representing 85 per cent of the track miles and the locomotives requited under the first order and 62 per cent of the track miles and 45 per cent of the locomotives under the second order.

Throughout the year records have been made of the performance, operation and maintenance of these installations. Many faults have been located and corrected while some of the characteristic features of different systems have been abandoned or redesigned to secure greater simplicity or more satisfactory operation. The ultimate purpose of the train control orders of the commission may, therefore, be said to be well under way, as train control is being developed intensively on a broad scale.

Rapid Progress Made on Construction in 1926

A year ago, on January 1, 1926, train control installations were in service on 24 of the 45 roads included in the first order and on only 3 roads in the second order. The year just closed has, therefore, been one of intense activity in field construction and in the application of train control equipment to locomotives. For example, practically the entire installation on 2,734 miles of tracks on the five roads of the New York Central Lines was carried out between March and July. The work of equipping the 1,321 locomotives was divided between several different shops on the various roads. At the Collinwood shop, near Cleveland, 288 engines were equipped at the rate of 93.7 man-hours each. On the Baltimore & Ohio similar equipment was applied to 117 engines with an average of 59-5/6 man-hours labor per engine.

Construction was particularly active during the first six months of the year, many of the roads making special efforts to complete their installations before July 1, which was considered the effective completion date. Ten installations under the first order and seven under the second order were placed in service during July. Only four additional installations under the first order were reported as completed during the last five months of the year, including the Chesapeake & Ohio, whose installation, of an intermittent inductive system of train stop, replaced an earlier installation of a ramp type system.

The year 1926, therefore, closes with only five installations required by the first order incomplete, i.e., the Chicago & Alton; the Long Island; the Pittsburgh, Cleveland, Cincinnati, Chicago & St. Louis; the West Jersey & Seashore, and the Richmond, Fredericksburg & Potomac. Of the 36 roads listed in the second order, 23 have their installations in service and on the remaining 13 roads construction is well along on 6 roads while plans are still indefinite on 7 roads.

Commission's Attitude More Tolerant

Throughout 1926, the Interstate Commerce Commission has been more tolerant in its dealings with the railroads involved in train control. The original order, which was issued in June, 1922, set the completion date as January 1, 1925. Aside from the three roads, the Chicago & Eastern Illinois, the Chicago Rock Island &

Pacific, and the Chesapeake & Ohio, which had train control in service prior to the issuance of the order, the completion date was met by only three roads, i.e., the Atchison, Topeka & Santa Fe; the Southern Pacific; and the Galveston, Harrisburg & San Antonio. The delay on many roads was occasioned by the modification of the order by the commission in June, 1924, permitting the permissive feature of the train stop which resulted in the decision of the courts in the Delaware & Hudson case which in effect extended the completion date to July 1, 1926.

The second order was issued on January 14, 1924, requiring a second division to be equipped with train control on 43 of the roads in the first order by February 1, 1926. As now effective, 36 roads are involved in this second order and of these the completion date of February 1, 1926, was met by only four roads, i.e., the Pere Marquette; the Union Pacific, the Illinois Central, and the Southern.

Cost of 18 of the 44 Train Control Installations Required by First I. C. C. Order

	Number loco.	Cost for all loco.	Miles of track	Cost, wayside	Cost, total
A. T. & S. F.	87	$305,370.54	203.9	$770,912.53	$1,090,893.19
A. C. L.	55	59,778.40	239.0	85,068.93	144,847.33
C. & N. W.	110	365,257.20	298.0	325,404.64	690,661.84
C. B. & Q.	56	.....	139.8	.....	165,743.07
C. M. & St. P.	58	112,322.00	216.2	93,014.00	205,336.00
C. R. R. of N. J.	30	108,416.50	65.6	647,954.45	756,370.95
D. L. & W.	69	238,669.62	282.0	341,055.18	579,724.80
G. H. & S. A.	38	.....	50.7	.....	78,608.08
G. N.	35	.....	142.6	.....	128,441.34
I. C.	56	137,653.60	243.6	157,879.75	295,533.35
Mo. P.	29	.....	50.0	.....	532,000.00
N. & W.	41	182,002.85	106.1	840,718.02	1,022,920.87
N. P.	35	45,676.00	109.6	55,682.00	101,358.00
P. M.	67	41,211.08	60.9	22,202.00	63,413.08
Reading	52	.....	113.0	.....	876,746.48
St. L.-S. F.	31	.....	44.4	.....	98,353.68
S. P.	125	.....	100.1	.....	306,261.00
U. P.	95	274,430.05	204.0	163,419.20	434,849.05
	1,069		2,669.5		$7,572,062.11

No general order has been issued postponing the completion date for either order. However, the commission has, for good and sufficient reasons, granted the requests of the carriers for extensions of time where diligent efforts were evident. The maximum extension granted has been to July 1, 1927.

Perhaps the most important action on the part of the commission during the year was to grant the requests of three roads to be relieved from complying with one or both of the orders. The Kansas City Southern was granted suspension from compliance with the first order until further instructions from the commission. In consideration of the Missouri Pacific's diligence in the installation of automatic block signals on 391 miles of line, the road's petition for relief from the second order was granted. Similar suspensions were granted the Chicago & Alton; the New York, Chicago & St. Louis, and the Boston & Maine. Prior to January 1, 1926, the Kansas City Southern, and the Pittsburgh & Lake Erie, had also been relieved from the second order. Therefore, the lists of January 1, 1927, include 44 roads on which the first order, and 36 roads on which the second order, is now effective.

Types of Devices Selected for First Order

	Roads	Locomotives	Miles of track	Per cent of total miles of track
Intermittent contact	2	243	541.6	7.1
Intermittent induction	24	2,233	3,932.33	51.4
Continuous stop	8	860	1,445.1	18.9
Continuous two-speed	6	436	1,235.3	16.2
Continuous three-speed	4	208	488.67	6.4

Inspection by the Commission

During 1925 the commission gathered a force of inspectors which, under the jurisdiction of the Bureau of Signals and Train Control, has made final inspections

Status of Train Stop and Train Control Required by First Order

Road	From	To	Miles of road	Miles of track	Manufacturer	Train Stop or Train Control	Continuous or Intermittent	Number of Locomotives	In Service Date
A. T. & S. F.	Chillicothe, Ill.	Shopton, Ia.	104.5	203.9	Union	Control	Cont.	87	1- 1-25
A. C. L.	Richmond, Va.	Rocky Mount, N. C.	119.0	239.0	General	Stop	Intr.	55	10- 1-25
B. & A.	Springfield, Mass.	Rensselaer, N. Y.	65.0	234.0	Union	Stop	Intr.	97	7- 5-26
B. & M.	W. Cambridge, Mass.	Deerfield	103.0	206.0	Union	Stop	Cont.	137	10-11-26
B. & O.	Baltimore, Md.	Washington, D. C.	36.3	73.2	General	Stop	Intr.	130	7- 1-26
C. R. of N. J.	Red Bank, N. J.	Winslow Jct.	65.6	65.6	Union	Stop	Cont.	137	10- 1-26
C. & A.	Chicago	Bloomington	127.0	229.1	National	Stop	Intr.	46	.....
C. & E. I.	Chicago	Danville	105.4	210.8	Miller	Stop	Ramp	138	11-21-14
C. & O.	Orange, Va.	Staunton	70.0	70.0	Union	Stop	Intr.	52	11- 1-26
C. & N. W.	Boone, Ia.	Council Bluffs	149.0	298.0	General	Control	Cont.	122	3- 1-26
C. B. & Q.	Creston, Ia.	Pacific Jct.	82.1	139.8	Sprague	Stop	Intr.	58	8-15-25
C. I. & L.	Hammond, Ind.	Monon	67.7	67.7	Sprague	Stop	Intr.	32	7- 1-26
C. M. & St. P.	Bridge Switch, Minn.	Hastings	108.0	216.2	Union	Stop	Cont.	58	12-15-25
C. R. I. & P.	Blue Island, Ill.	Rock Island	165.0	330.8	Regan	Control	Intr.	105	11- 1-21
C. N. O. & T. P.	Ludlow, Ky.	Somerset	156.0	235.0	General	Stop	Intr.	95	6-12-26
C. C. C. & St. L.	Indianapolis, Ind.	Mattoon, Ill.	129.0	195.0	General	Stop	Intr.	72	7-18-26
D. & H.	White Hall, N. Y.	Rouses Point	108.0	118.3	General	Stop	Intr.	60	7- 1-26
D. L. & W.	Elmira, N. Y.	East Buffalo	141.0	282.0	Union	Control	Cont.	69	7- 1-25
Erie	Sparrowbush, N. Y.	Lanesboro	104.2	204.0	General	Stop	Intr.	86	11- 9-26
G. H. & S. A.	Rosenberg, Tex.	Glidden	50.7	50.7	National	Stop	Intr.	38	1-11-25
G. N.	Minot, N. D.	Williston	120.0	142.6	Sprague	Stop	Intr.	35	9-15-25
I. C.	Champaign, Ill.	Branch Jct.	122.0	243.6	Union	Stop	Cont.	56	3- 2-25
L. I.	Winfield Jct.	Whitestone	20.8	32.8	Union	Stop	Cont.	104	.....
L. & N.	Corbin, Ky.	Etowah, Tenn.	162.0	162.0	Union	Control	Cont.	47	7- 1-25
L. V.	Newark, N. J.	Easton, Pa.	65.8	175.0	General	Stop	Intr.	130	9- 1-26
M. C.	Detroit, Mich.	Jackson	74.5	149.0	General	Stop	Intr.	170	7-18-26
Mo. P.	Leeds, Mo.	Osowatomie, Kan.	50.0	50.0	National	Stop	Intr.	39	7- 1-25
N. Y. C.	Albany, N. Y.	Syracuse	145.1	553.1	General	Stop	Intr.	444	7- 1-26
N. Y. C. & St. L.	Ft. Wayne, Ind.	Chicago	141.0	154.8	Union	Stop	Intr.	45	8-12-26
N. Y., N. H. & H.	Air Line Jct.	Springfield, Mass.	62.0	109.6	U. and G.	Control	Cont.	60	7-10-26
N. & W.	Hagerstown, Md.	Shenandoah, Va.	106.1	106.1	Union	Control	Cont.	41	3-15-25
N. P.	Mandan, N. D.	Dickinson	109.5	109.6	Sprague	Stop	Intr.	35	9-30-25
O. W. R. & N.	Portland, Ore.	The Dalles	84.0	86.1	Union	Control	Cont.	33	4- 1-25
Pennsylvania	Baltimore, Md.	Harrisburgh, Pa.	83.0	163.0	Union	Stop	Cont.	149	7-17-26
P. C. C. & St. L.	Columbus, Ohio	Indianapolis, Ind.	179.4	345.6	Union	Stop	Cont.	122	.....
P. & L. E.	Pittsburgh, Pa.	Youngstown, Ohio	68.7	227.7	Union	Stop	Intr.	103	7-18-26
P. M.	Seymour, Mich.	No. Lansing	60.9	60.9	General	Stop	Intr.	65	1-31-26
Reading	Camden, N. J.	Atlantic City	58.0	113.0	Union	Control	Cont.	50	4- 1-25
R. F. & P.	Richmond, Va.	Block Station, A. F.	101.6	203.2	Union	Control	Cont.	66	.....
S. P.	Oakland, Calif.	Tracy	74.6	100.1	National	Stop	Intr.	125	1- 1-25
Southern	Spencer, N. C.	Greenville, S. C.	153.0	308.1	General	Stop	Intr.	65	11-28-25
St. L.-S. F.	Nichols, Mo.	Monett	40.0	44.4	National	Stop	Intr.	40	6-25-25
U. P.	Sidney, Nebr.	Cheyenne, Wyo.	102.0	204.0	Union	Control	Cont.	99	6- 1-25
W. J. & S.	Camden, N. J.	Atlantic City	58.0	112.4	Union	Stop	Cont.	136	.....
Total				7,643.0				3,837	

of nine complete divisional installations and rendered reports on five of these up to January 1, 1926. This program of inspections was carried on consistently by several field parties throughout 1926 so that final inspections have been completed on about 35 installations required under the first order and reports rendered on 22 installations. Final inspections were also made of installations required under the second order on eight roads, and four reports have been issued.

Included in each final report is a statement of the cost of the train control installation. The amount of work involved in revising the signaling, rebuilding pole lines, etc., varied on different roads; therefore in order to get a true comparison of the cost of the various systems of train control a detailed study of local conditions is required. However, these figures show an expenditure of $7,572,062 on the 2,669.5 miles of tracks and 1,069 locomotives in service on the 18 roads on which final reports have been rendered. The railroads as a whole have, therefore, expended at least $25,000,000 for train control up to date.

Of the final reports available early in January three covered the installation of the National Safety Appliance Company's intermittent train stop system on the Southern Pacific; the Galveston, Harrisburg & San Antonio, and the St. Louis-San Francisco. The exceptions to complete approval included items concerning certain valves and a means for checking the position of the track magnet. The latter exception was not mentioned in the report on the second division. The Missouri Pacific, which also used the National system, received complete approval of the train control system, the only exception being an item requiring adjustment in directional control boxes on the passing tracks which was soon corrected.

The next series of reports included the Reading, the Union Pacific, and the Atchison, Topeka & Santa Fe, which are using the Union Switch & Signal Company's continuous train control system. The Santa Fe installation is of special interest because this road carried out the early suggestion of the commission that train control with cab signals could be used without intermediate wayside automatic signals. The Reading was required to correct an auxiliary automatic cut-in arrangement, the Santa Fe was required to install pressure-maintaining valves on all locomotives, while the Union Pacific received complete approval without exception. At this point it should be explained that in the final reports of the Norfolk & Western and the Oregon-Washington Railroad & Navigation Company, using the Union continuous train control, exception had been taken to the fact that enginemen were not required to acknowledge at succeeding stop signals. As a result of a special hearing on January 14, 1926, a report was issued by the commission on March 9, 1926, eliminating this exception from the reports of the two roads mentioned. Therefore, no such item was mentioned in reports of similar installations issued subsequently.

The Chicago & North Western installation of the General Railway Signal Company's continuous train control received complete approval without exception in a report issued October 21.

The continuous train stop, without speed control, as manufactured by the Union Switch & Signal Company and as installed on several roads was given complete approval in the reports of the installation on the Illinois Central. This road uses cab signals with no intermediate wayside signals.

Another distinctly different type of equipment, the General Railway Signal Company's intermittent inductive system, is being used on 12 roads and the first final report issued on this system was that of the Atlantic Coast Line which included an exception concerning the wiring leading to a track inductor. In the report of the Pere Marquette installation using the same type of equipment no such exception was made to approval.

The Sprague Safety Control & Signal Corporation's system of intermittent magnetic train stop received approval in the report on the Northern Pacific installation, the only exception being the requirement that means be applied to all locomotives to prevent overcharging of the capacity reservoir.

Status of Train Stop and Train Control Required by Second Order

Road	From	To	Miles of road	Miles of track	Manufacturer	Train Stop or Train Control	Continuous or Intermittent	Number of Locomotives	In Service Date
A. T. & S. F.	Pequot, Ill.	Chillicothe	72.9	145.8	Union	Control	Cont.	*...	7-18-26
A. C. L.	So. Rocky Mount, N. C.	Florence	172.1	344.2	General	Stop	Intr.	100	.....
B. & A.	Boston, Mass.	Springfield	98.0	258.2	General	Stop	Intr.	*...	7-18-26
B. & O.	Baltimore, Md.	Philadelphia, Pa.	97.0	185.0	General	Stop	Intr.	75	11- 1-26
C. R. of N. J.	Elizabethport, N. J.	Baybead	53.0	49.7	Union	Control	Cont.	...	.....
C. & O.	Staunton, Va.	Clifton Forge	55.0	55.0	Union	Stop	Intr.	*...	11- 1-26
C. & E. I.	Danville, Ill.	Clinton, Ind.	39.7	74.4	Miller	Stop	Intr.	78	10-18-26
C. & N. W.	Clinton, Ia.	Boone	207.0	414.0	General	Control	Cont.	70	.....
C. B. & Q.	Pacific Jct., Ia.	Lincoln, Nebr.	76.0	99.5	Sprague	Stop	Intr.	39	7-18-26
C. I. & L.	Monon, Ind.	Indianapolis, Ind.	95.1	92.0	.....	.....	.....	....	.....
C. M. & St. P.	LaCrosse, Wis.	Portage	101.0	206.1	Union	Stop	Cont.	38	.....
C. R. I. & P.	Davenport, Ia.	Des Moines	172.0	243.7	Regan	Control	Intr.	50	10-28-26
C. N. O. & T. P.	Somerset, Ky.	Chattanooga, Tenn.	177.2	257.7	General	Stop	Intr.	63	6-12-26
C. C. C. & St. L.	Mattoon, Ill.	Lenox	....	181.1	General	Stop	Intr.	15	7-18-26
D. & H.	Albany, N. Y.	Whitehall	77.0	154.0	.....	.....	.....	....	.....
D. L. & W.	Elmira, N. Y.	Scranton, Pa.	116.0	262.8	Union	Control	Cont.	130	.....
Erie	Buffalo, N. Y.	Hornell	92.6	184.0	General	Stop	Intr.	...	.....
G. H. & S. A.	Glidden, Tex.	San Antonio	123.0	123.0	National	Stop	Intr.	13	5-15-26
G. N.	New Rockford, N. D.	Minot	108.9	113.0	Sprague	Stop	Intr.	24	7-18-26
I. C.	Waterloo, Ia.	Ft. Dodge	96.0	98.3	Union	Stop	Cont.	38	1-29-26
L. I.	Jamaica, L. I.	Babylon	27.6	55.3	Union	.....	.....	110	.....
L. & N.	Mobile, Ala.	New Orleans, La.	139.0	139.0	Union	Stop	Cont.	...	.....
L. V.	Easton, Pa.	Sayre	194.0	484.5	General	Stop	Intr.	175	.....
M. C.	Jackson, Mich.	Niles	117.0	233.0	General	Stop	Intr.	*...	7-18-26
N. Y. C.	Cleveland, Ohio.	Buffalo, N. Y.	182.0	702.0	General	Stop	Intr.	375	7-18-26
N. Y. N. H. & H.	New Haven, Conn.	Providence, R. I.	113.0	226.0	.....	.....	.....	178	.....
N. & W.	Roanoke, Va.	Shenandoah	132.0	132.6	Union	Control	Cont.	44	1- 1-27
N. P.	Dickinson, N. D.	Glendive, Mont.	106.0	106.0	Sprague	Stop	Intr.	†8	8- 6-26
Penna.	Harrisburgh, Pa.	Altoona	130.8	490.0	Union	Stop	Cont.	342	.....
P. C. C. & St. L.	Pittsburgh, Pa.	Newark, Ohio.	156.9	378.0	Union	Stop	Cont.	306	.....
P. M.	Lansing, Mich.	Detroit	74.0	85.0	General	Stop	Intr.	*...	1-31-26
Reading	Bethlehem, Pa.	Jenkintown	45.8	71.0	.....	.....	.....	....	.....
S. P.	Tracy, Calif.	Fresno	125.0	125.0	National	Stop	Intr.	75	2- 1-26
Southern	Greenville, S. C.	Atlanta, Ga.	153.0	306.8	General	Stop	Intr.	35	11-28-25
St. L.-S. F.	Monett, Mo.	Afton, Okla.	66.1	71.0	National	Stop	Intr.	32	12-31-26
U. P.	North Platte, Nebr.	Sidney	123.0	248.0	Union	Control	Cont.	31	2- 1-26
Total				7,410.9					

* All locomotives operating on both territories equipped for first order.
† Additional locomotives equipped for second order.

Suggestions of Commission Helpful

All of the reports of the commission included suggestions on the maintenance of the train control which were of assistance to the roads in knowing what was desired in the way of slight changes, etc. Most of these suggestions applied specifically to conditions on a particular road. However, one criticism included in the majority of the reports was as follows: "The type of fouling protection employed at sidings and crossovers should be given careful consideration with the view to providing possibly increased protection." A few roads have met this suggestion by installing special shunting circuits or in some cases, as, for example, the Burlington, a special trap track circuit is used to insure that the signals on both main tracks will remain at danger when any part of the cross-over is occupied, regardless of how the switches are lined. The Delaware & Hudson also provides a separate track circuit for shunt foulings. The majority of the roads contend that this expense is not justified in view of the few instances when a light engine only will use a cross-over and that in such moves the rule requiring both switches to be lined for the movement while the cross-over is occupied, will provide adequate protection. They believe that by using the proper size and number of shunt wires, well constructed and maintained, all that can reasonably be expected is thus secured.

Lessons Learned in Maintenance and Operation

Records are maintained by the railroads indicating the engine trips made over train control territory with the device cut-in or cut-out, and also the number of failures, undesirable stops, false clear operations, etc. These records are of value to each railroad in checking its own operation in comparison with previous periods. However, with a few exceptions, conditions vary so widely on different roads that any intelligent comparison of operating results between different roads is impossible as yet.

Experience has shown that even the most complicated systems of train control can be so maintained as to render satisfactory performance under heavy traffic, and also, on the other hand, that simple systems of train stop, when neglected, can cause numerous delays to traffic. Some systems require from $65 to $80 per engine per month for maintenance, while others cost from $5 to $10, differences in accounting methods being responsible for certain discrepancies. The cost for the maintenance of the wayside train control apparatus varies from less than $1 to over $15 per mile per month, depending on the number of brake indication points and whether signals are used or not, the higher figure applying to some roads not using wayside intermediate automatic signals, which results in the major portion of all wayside equipment being chargeable to train control rather than to signals.

The manufacturers of train control systems have been following the operation of their equipment in the field and have co-operated with the railroads in making changes that will reduce the failures and the cost of maintenance. Improvements and simplifications are being made in such rapid succession that much of the equipment installed a year ago is now out of date. Simplification of engine governor drives and valve arrangements are now available that are estimated by one road to reduce maintenance costs 25 per cent. In some localities it has been considered advisable to use high frequencies of alternating current for train control to eliminate false operations.

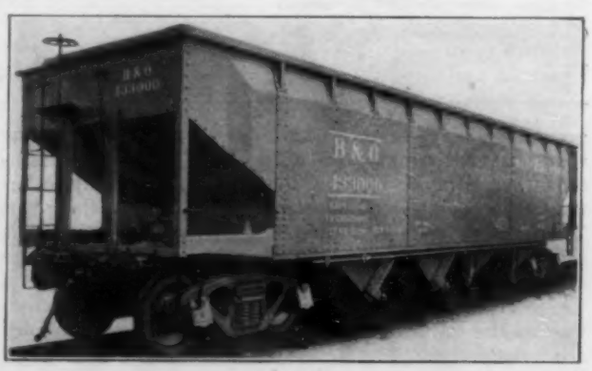
The new coder system developed on the Pennsylvania, but not yet in service, tends to revolutionize the continuous system for those roads desiring more cab indications or non-interference from other circuits, especially on electrified territory. The recent announcement that the two larger signal companies have secured rights to manufacture and sell the intermittent inductive system of the Miller company will, no doubt, result in the development of a system eliminating many of the recognized faults of certain earlier inductive systems.

A Glance into the Future of Train Control

The Interstate Commerce Commission has done its part to force the intensive development of train control on a large scale. A few years' experience will furnish data as to the benefits derived and show whether train control is justified on the larger percentage of the principal railroad mileage of the country. Some roads may voluntarily extend train control installations where engines already equipped can be used to advantage without additional expenditure for such apparatus. For the promotion of safety and as an advertising asset it may be expected that train control installations will be extended to include through routes between large cities.

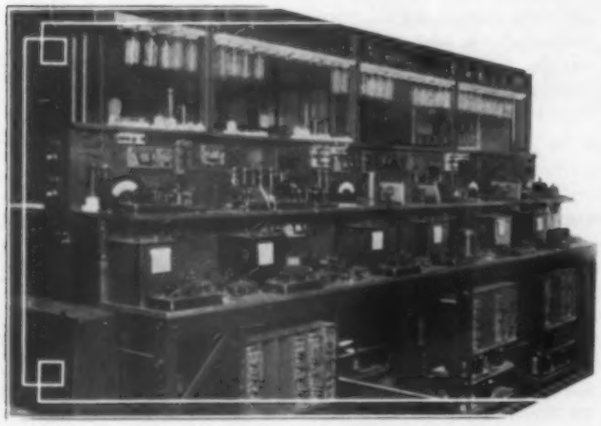
One of the greatest advantages of train control, as reported by the operating officers and enginemen, is the benefit of the cab signal which brings the wayside indication into the locomotive cab. The Atchison, Topeka & Santa Fe and the Illinois Central are demonstrating the practicability of operating without wayside intermediate signals and this idea bids fair to be considered in future signaling. The use of train control with speed control to permit trains to pass automatic signals indicating stop at speeds under 20 miles an hour, will be the means of introducing decided economy by eliminating train stops. However, to date it is understood that the Chicago, Rock Island & Pacific is the only one of the 11 roads using train control with speed control, that is taking advantage of this feature.

So far as the development of train control is concerned there would appear to be no justification for further blanket orders on the part of the commission; in fact, there appears to be no such intention at the present time. When the benefits of train control are more thoroughly understood certain roads will no doubt incorporate such equipment with automatic signal installations voluntarily, while the commission may also request certain roads to make train control installations where the traffic and accident records make it evident that additional protection is needed.



Baltimore & Ohio 70-Ton Hopper Built by the Standard Steel Car Company—This Design Is Along the Lines Recommended by the Committee on Car Construction, Mechanical Division, A. R. A.

Large Increase in Communication Facilities in 1926



A Telegraph Repeater Table on the Big Four

Copper wire mileage for telephone and telegraph purposes increased 39,790 — Automatic printers added on 6,512 circuit miles — Continued activity anticipated in 1927

By R. S. Kenrick
Associate Editor, *Railway Age*

RECORD-BREAKING freight business on the railroads of the United States in 1926 is reflected in unusual activity in the telegraph and telephone departments during the last 12 months. It is recognized generally that construction work in this field usually moves in close accord with fluctuations in traffic. To provide an efficient and economical method of communication capable of meeting the demands of heavier traffic a number of railroads, particularly in the southern territory, have been faced with the necessity of adopting comprehensive programs of construction in order to eliminate the possibilities of congestion and costly operating delays in the future. Generally speaking, the roads have been able to keep up with their plant maintenance and hence most of them do not anticipate other than the normal amount of maintenance work this year. There are many indications, however, of a greater interest in those devices that are capable of increasing the capacity and efficiency of facilities in this department. This review, which is our seventh annual one of activities in the railway communication field, was compiled from data supplied by 97 leading railroads in the United States and Canada.

Table A—Principal Increases in Facilities During 1926 Compared with 1925

		Miles	
		1926	1925
New or rebuilt pole lines	.....	9,780.8	1,307.0
Railroad owned	2,628.5	.....	.....
Commercial owned	5,363.8	.....	.....
Jointly owned	1,788.5	.....	.....
Copper wire installed	.....	39,790.0	27,757.0
Railroad owned	29,297.8	.....	.....
Commercial owned	9,527.2	.....	.....
Jointly owned	996.0	.....	.....
Iron wire installed	.....	1,816.3	2,995.0
Road mileage dispatched by telegraph decreased	.....	*4,223.2	*783.0
Road mileage dispatched by telephone increased	.....	5,739.5	3,453.8
Long distance message or conversational lines	.....	7,805.2	6,740.9
Phantom telephone circuits	.....	3,318.7	4,294.4
Telegraph circuit obtained by simplexing	.....	7,630.9	7,607.5
Circuit mileage operated by printing telegraph	.....	6,512.0	3,462.0

*Decrease.

Construction Work Completed in 1926

Statistically, the outstanding feature of activities in this field during the past year was the installation of 39,790 miles of copper wire for telephone and telegraph circuits. In this respect alone 1926 witnessed 43 per cent more work in the railway communication departments than 1925. The mileage of new or rebuilt pole lines also exceeded considerably the 1925 figure as shown in Table A. Here the difference, 8,473.8 miles, represents an increase of 650 per cent over the amount of this type of work completed in 1925. The telephone continued to supplant the telegraph for purpose of dispatching trains, the increase in road mileage dispatched by telephone during 1926 being 5,739.5. That the telephone is also becoming more useful for long distance work is evidenced clearly by the extension of 7,805.2 miles of message or conversational lines for trunk line service. The major installations of copper wire are given in Table B, from which it will be noted that the Pennsylvania installed the greatest amount (4,093.9 miles) while the Canadian Pacific added 3,260.2 miles of copper wire.

One of the notable developments of the year in the railway telegraph and telephone field was the practical demonstration of radio communication between the head end and caboose of a New York Central freight train, operating between Chicago and Elkhart, Ind., on July 9. This test run, which covered 95 miles, was made with a 115-car train under the supervision of Committee 12—Radio and Carrier Current Systems, of the Telegraph and Telephone section of the American Railway Association. The radio equipment performed satisfactorily during this trip, with much time-saving information regarding the operation of the train being exchanged. From reports at hand, the general opinion prevails among rail-

Table B—Mileage of Principal Copper Wire Installations in 1926

Road	Railroad Owned	Commercial Owned	Total
Penna.	4,093.9	1,800.7	5,894.6
C. P. R.	3,236.1	24.1	3,260.2
M. P. (System)	1,930.3	1,188.9	3,119.2
Southern (System)	1,314.6	808.7	2,122.8
N. Y., N. H. & H. (Incl. C. N. E.)	2,052.0	.....	2,052.0
Erie	753.0	1,192.0	1,945.0
A. C. L.	1,906.2	.....	1,906.2
A. T. & S. F.	1,585.0	320.0	1,905.0
N. Y. C. (System)	1,639.5	202.0	1,841.5
S. P. (System)	1,571.4	190.7	1,762.1
S. A. L.	1,110.9	.....	1,110.9
C. & O.	996.6	15.6	1,012.2
Reading	568.3	284.2	852.5
D. & H.	320.0	500.0	820.0

way telegraph and telephone officers that radio facilities similar to those used in the New York Central demonstration will find an increasing application in the operation of long freight trains, especially in mountainous regions.*

Another notable tendency during the year was the installation of printing telegraph machines for hump yard service. This improvement is necessitated by the greater speed with which freight cars can be classified in hump yards equipped with car retarders. With manual braking of cars, the element of time devoted to the delivery of switching lists was not of primary importance, but a different situation exists at those yards using mechanical retarding units. The first telegraph printer installation of this nature was made at the Gibson, Ind., yard of the Indiana Harbor Belt early last year. A larger installation of the same type of telegraph printer is now in service at the new Markham yard of the Illinois Central. In this case two transmitters in the main yard office combine the functions of a typewriter and telegraph key, and receiving machines delivered the lists in typed form in the nine car-retarder towers of the northbound and southbound yards. With this system the requisite information is in the hands of the retarder operators within 20 to 30 min. after a train enters one of the receiving yards.

Table C—Major Items Reported as Contemplated for 1927

		Miles
New or rebuilt pole lines	.....	6,536.0
Railroad owned	1,346.3	.....
Commercial owned	3,489.4	.....
Jointly owned	1,703.3	.....
Copper wire	.....	22,386.7
Railroad owned	19,701.0	.....
Commercial owned	2,474.7	.....
Road mileage dispatched by telegraph will decrease		2,072.3
Road mileage dispatched by telephone will increase	.....	2,280.9
Long distance message or conversational lines	.....	4,911.3
Phantom telephone circuits	.....	3,401.3
Circuit mileage operated by printing telegraph will increase	.....	2,097.0

Loud speaking telephones have been employed on telephone dispatching circuits for several years, but what is probably the first loud speaker installation for transmitting instructions to yard switchmen on the ground was made during the past year at the St. Paul Union Depot, St. Paul, Minn. This equipment which is essentially the public address system adapted to the particular needs of this passenger terminal, is used for directing movements of trains and engines into and out of the east approach to the station.

The printing telegraph has found an increasing application in the railway field due to the increased message capacity and lower unit costs of handling traffic resulting from its use. Eight railroads reported increases in their circuit mileage operated by the telegraph printer, totaling 6,512 miles. The Atchison, Topeka & Santa Fe extended its printer service on 2,746 circuit miles while the Canadian Pacific added 1,902 miles of circuit to its already large mileage of printing telegraph equipment; and the Pennsylvania installed 1011.5 additional miles of printer circuit. Compared with the increase in printer service made during 1925 (3,462 miles) the installations reported completed during the year just closed represent what might be interpreted as an indication of an accelerating tendency to adopt the printer in view of the increase in capacity and efficiency which it is possible to realize with it. During 1926, the Santa Fe installed two single channel printer circuits between Chicago and Topeka, Kan., and one two-channel multiplex printer circuit between Topeka and Los Angeles, Calif. The Big Four added automatic page printers between Indianapolis, Ind., and Cincinnati, Ohio, with a material increase in capacity and a reduction in the unit cost of handling messages.

Other changes and additions made recently to expedite the communication service on railroads include the extension of long distance telephone trunk circuits, interconnected where feasible through automatic private branch exchanges, an increase in telephone train dispatching circuits and local telephone message circuits, improved transmission quality and volume through the installation of loading coils and telephone repeaters, installation of telephone circuits in cable following the practice of the Bell system, and the substitution of rectifiers in connection with the a-c. floating system which employs storage cells in place of dry cells for telephone selector circuits. One road which made the last named change reported a decided improvement in service and more economical operation.

Most Work Completed Before Close of the Year

The amount of construction work reported as being under way at the close of the year is relatively small when compared to that completed earlier in the year. This indicates that the telegraph departments follow the policy of conducting practically all of their construction activities during the most favorable months of the year. Eleven roads were either constructing or rebuilding 721.2 miles of pole line, while the telegraph companies on 16 railroads were either building new or rehabilitating, 1,706.6 miles of line and 6 roads were doing work on 1,200.4 miles of joint pole line at the close of the year. Only 5,496 miles of railroad-owned copper wire was being installed at the end of 1926 on a total of 13 roads. Six roads were in the process of completing 1,618.5 miles of long distance message or conversational circuits at the end of 1926.

From replies received from 38 superintendents of telegraph in response to a questionnaire from the *Railway Age* a healthy condition of plant maintenance is indicated. Only 3 telegraph officers reported that they are not up to date in their outside maintenance work.

Table D—Mileage of Principal Copper Wire Installations Contemplated for 1927

Road	Railroad Owned	Commercial Owned	Total
C. M. & St. P.	4,404.0	.....	4,404.0
N. Y., N. H. & H.	2,808.0	.....	2,808.0
U. P. (System)	1,551.2	.....	1,551.2
N. Y. C. (System)	1,247.4	81.2	1,328.6
M-K-T	1,050.0	.....	1,050.0
A. T. & S. F.	1,028.0	.....	1,028.0
L. V.	1,022.0	.....	1,022.0
I. C.	1,000.0	.....	1,000.0
C. I. & L.	580.0	300.0	880.0
D. & H.	300.0	560.0	860.0
C. of Ga.	858.0	.....	858.0
Penna.	821.6	16.0	837.6
C. & E. I.	.....	771.0	771.0
L. & N.	648.0	.....	648.0

The heavy maintenance and reconstruction work which was carried out intensively in the years immediately following the return of the railroads to private operation in 1920 and continued almost uninterruptedly but in diminishing volume up to the present time, is in a large measure responsible for this favorable state of affairs. On the whole the outlook is bright for a continued intensive maintenance program covering both inside and outside plants, although the latter is generally considered more important. This is true even on roads which make it a practice to maintain their communication facilities at a high standard because it enables them to

* See *Railway Age*, July 17, 1926, p. 100, for account of New York Central experiment.

handle a gradually increasing volume of business expeditiously.

"The efficient operation of the railroad is leaning heavily on our communication system, making it absolutely necessary to maintain the telegraph and telephone plant so that it will operate efficiently and at full capacity at all times," were the words used by a telegraph officer on a trunk line railroad in the middle west. One of the New England roads which reported its general maintenance up to date and a bright outlook for a continued standard maintenance program as well as for the installation of proposed communication circuits, replied that, "The management of our railroad insists upon proper maintenance and is anxious to carry out our program for additional telephone facilities to take the place of Morse operation now in service."

Additional Printer Circuits and Extension of Telephone Service

It is impossible at this time to make other than an approximate estimate of the volume and nature of the construction work in the railway communication field in 1927, owing largely to the fact that the budgets for this year have not as yet been approved on a majority of the railroads reporting. A fair indication of the activity in this direction is afforded, however, by a study of those roads who have work contemplated for this year. The principal items of work are listed in Table C from which it appears that the new year will witness at least as much activity as the past year. This table was compiled from reports obtained from 42 roads which at this time are definitely contemplating work for this year. Of primary interest is the installation of 22,386.7 miles of copper wire for both telephone and telegraph circuits which is a little greater than the copper wire mileage reported a year ago (21,540) as contemplated for 1926. It is fair to assume that inasmuch as the copper wire actually strung in 1926 (33,426.4 miles) was 55 per cent greater than the contemplated figure a similar ratio will prevail in 1927, which is reason for anticipating a continuation of the present tendency to install more copper and less iron. It is also an indication that the telephone will continue to supplant the telegraph for train dispatching service, that 16 roads plan to make additions to their long distance 'phone circuits totaling 4,911.3 miles, while 11 roads contemplate phantoming their present and future telephone circuits to the extent of 3,401.3 miles. It is planned to extend the use of the telegraph printer on 2,097.0 miles of circuits. The Santa Fe will probably make the greatest increase in printer circuits this year for its contemplated extension, 2,074 miles, approaches in size the installation it completed in 1926 (2,746 miles) which was by far the largest for that year.

Table D lists the roads which are planning the largest increases in their copper wire mileages. It will be noted that the St. Paul heads the list, which is due to the comprehensive construction and rebuilding program recommended in the 1927 budget. A total expenditure of $533,440 is estimated to cover the construction of approximately 4,510 miles of new wires and cables and the reconstruction of about 380 miles of telegraph line. It is expected that a good share of this recommended work will be authorized by the St. Paul management in order that its telegraph facilities shall be adequate to handle properly the increase in business.

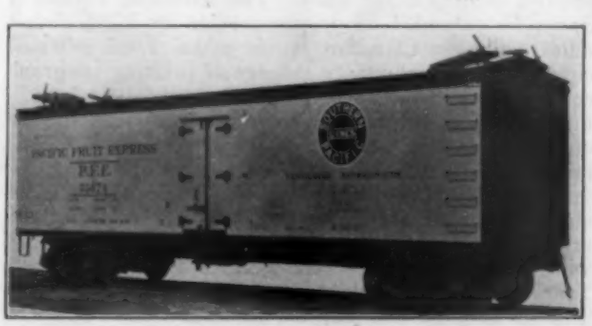
Strengthening and rebuilding of poles, lines and other strictly maintenance work should be given preference, according to the views of 15 telegraph officers, but 9 report that the extension of telephone circuits for telephone train dispatching and message service should receive first consideration. In fact, one road reported the need for the latter as "most urgent." The inside and outside plants should be maintained and improved so that they will keep in step with each other. Together, the two should preferably be just a step ahead of the demand on the service in order to be able to handle increased business when it is offered. Greater service from the present telephone plant can be obtained through the installation of telephone repeaters and this should receive attention. The re-working of the earlier telephone installations, substituting improved apparatus and practices for obsolete apparatus and practices is worthy of careful consideration.

What About the Future?

There is every evidence of a decided inclination to recommend the telegraph printer for long distance traffic and for inter-communicating purposes at yards and terminals. This attitude is no doubt prompted by the growing scarcity of competent operators to handle heavy Morse circuits. Endorsement of the printer for universal service is not indicated in most of the replies received, the viewpoint of the telegraph officers being about as follows, "On some of the larger roads where business is very heavy, printers have proven satisfactory during the daily business peak between 10 a. m. and 4 p. m. when the file is very heavy. Printers, however, are not required on smaller lines where business does not justify their expense."

Undoubtedly a continued extension of telephone circuits will be carried out in the future because of the distinct trend evident in the supplanting of the telegraph by the telephone for dispatching lines. There is, moreover, a greater need for long distance trunk circuits to tie together the far corners of a large railway system in the interest of operating efficiency. The telephone is pushing the telegraph aside for divisional communication.

Radio as an auxiliary to the physical plant of the telegraph department is believed by many likely to become an important factor in railway operation. Its particular application seems to be for head to rear end communication on long freight trains although several consider it a valuable aid when the normal channels of communication fail. The "carrier system" of increasing wire capacity is credited with having possibilities in the railway field when traffic conditions reach the limit of existing wires. This involves the installation of apparatus which is closely associated with radio and this is also true to a lesser degree with the "public address system" which some railway men believe should be used more generally in connection with the switching of cars and equipment. Such loud speaker telephone service will be found economical in many cases because of the expeditious manner in which these operations can be conducted.



Refrigerator Car Built for the Pacific Fruit Express by the Standard Steel Car Company

A Chronological Review of 1926

Leading events of the year in the railway world, arranged for ready reference, according to dates

By R. A. Doster
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JANUARY

January 1, 1926.—Commissioner Joseph B. Eastman was elected chairman of the Interstate Commerce Commission for the ensuing year.

January 6.—James H. Hustis, president of the Boston & Maine, resigned effective April 14.

January 7.—The first joint national conference of the 12 shippers' regional advisory boards of the United States convened at the Blackstone hotel, Chicago.

January 8.—A plan providing new machinery for the adjustment of railway labor disputes, agreed upon by representatives of the roads and of the railway labor organizations, was included in a bill introduced in Congress by Chairman Watson.

January 14.—The Chateau Frontenac, the Canadian Pacific's hostelry at Quebec, was damaged to the extent of about $2,000,000, by fire.

January 22.—The St. Louis-San Francisco acquired a substantial interest in the Chicago, Rock Island & Pacific.

January 26.—The hearing before the Interstate Commerce Commission on the application of western carriers for an increase of five per cent in freight rates was concluded at Kansas City, Mo.

FEBRUARY

February 1.—The new passenger terminal improvements of the St. Paul Union Depot Company, which had been under construction since 1917, were completed.

February 2.—Demands for wage increases in train and yard service, averaging about 20 per cent over existing scales and ranging from about 15 per cent in the case of passenger conductors to more than 27 per cent in the case of passenger trainmen, were presented to the eastern railroads by the general chairman of the Order of Railway Conductors and the Brotherhood of Railroad Trainmen.

February 3.—The New Orleans rate relationship case was opened before the Interstate Commerce Commission at New Orleans.

February 3.—Wible L. Mapother, president of the Louisville & Nashville, died of heart disease at Panama.

February 6.—The Interstate Commerce Commission approved the proposal of the Northern Pacific and the Minneapolis, St. Paul & Sault Ste. Marie to establish joint passenger train service between Minneapolis, Minn.-St. Paul, and Duluth, Minn.,-Superior, Wis., and to divide the earnings therefrom under the terms and conditions of a contract entered into by them on December 24, 1925, to run for three years.

February 12.—The British Columbia legislature passed the Pacific Great Eastern Railway Land Grant Act which provides that four blocks of land containing approximately 16,000,000 acres and valued at $80,000,000, be transferred to the Pacific Great Eastern to enable the government to negotiate its sale.

MARCH

March 2.—The Interstate Commerce Commission refused the application of the New York, Chicago & St. Louis to acquire and unify the Chesapeake & Ohio, the Hocking Valley, the Erie and the Pere Marquette.

March 4.—The Alton Transportation Company, a subsidiary of the Chicago & Alton, was granted permission by the Illinois Commerce Commission to operate motor buses paralleling the main line of the Alton between Joliet, Ill., and Springfield, 148 miles.

March 18.—Whitefoord R. Cole, president of the Nashville, Chattanooga & St. Louis, was elected president of the Louisville & Nashville, to succeed W. L. Mapother, deceased.

March 22.—James B. Hill, treasurer and assistant to the president of the Nashville, Chattanooga & St. Louis, was elected president, to succeed W. R. Cole, resigned.

March 24.—The Gooding Bill, intended to prohibit the Interstate Commerce Commission from granting railroads fourth section relief to enable them to charge lower rates for a long haul than for a short haul to meet water competition, was defeated in the Senate.

APRIL

April 1.—The Illinois Central completed and put into operation its Markham yard, one of the largest and most complete classification yards in the country.

April 13.—Charles N. Whitehead, executive vice-president of the Missouri-Kansas-Texas, was elected president of the Missouri-Kansas-Texas of Texas and later of the Missouri-Kansas-Texas.

April 17.—The New York Central celebrated the 100th anniversary of the granting of the charter of the Mohawk & Hudson River Railroad on April 17, 1826.

April 20.—The merger of the American Locomotive Company and the Railway Steel Spring Company was approved by the stockholders.

MAY

May 1.—Edmund Pennington, chairman of the board of directors of the Minneapolis, St. Paul & Sault Ste. Marie, died.

May 1.—Charles E. Schaff, president of the Missouri-Kansas-Texas, retired.

May 3.—The authority of the Interstate Commerce Commission under the Transportation Act to authorize the abandonment of a branch line wholly within a state was upheld by a decision of the United States Supreme Court.

May 3.—Employees stopped work on British railways following the orders of the Trades Union Congress calling for a general strike in sympathy with the coal miners who had ceased work on May 1.

May 11.—The Watson-Parker railroad labor bill, abolishing the Railroad Labor Board and providing for the creation of boards of adjustment, a board of mediation to be appointed by the President, methods of submitting railroad labor disputes to arbitration, and when occasion demands, for the appointment of an emergency board by the President, was passed by the Senate.

May 12.—Examiner Haskell C. Davis recommended that the Interstate Commerce Commission deny the proposed lease of the Virginian to the Norfolk & Western for 999 years, finding that the latter had failed to sustain the burden of showing that the proposed lease is in the public interest.

May 14.—Frederick F. Fitzpatrick, president of the Railway Steel-Spring Company, was elected president of the American Locomotive Company, to succeed W. H. Woodin, elected chairman of the board. Alexander S. Henry, vice-president of the Railway Steel-Spring Company, was elected president of the latter company.

JUNE

June 1.—The draft gear activities of the Westinghouse Air Brake Company were taken over by the Westinghouse Friction Draft Gear Company, Chicago.

June 16.—Fourteen passengers and 4 employees were killed and 13 passengers and 1 employee were injured in a rear

collision of passenger trains on the Pennsylvania at Gray, Pa.

June 16.—Five persons were burned to death and seven others were injured when a tourist car in Union Pacific train No. 26 caught fire near Crystal, Nev.

JULY

July 4 to 11.—The Missouri Pacific celebrated the 75th anniversary of the breaking of ground for the beginning of the construction of what is now the Missouri Pacific.

July 10.—The Interstate Commerce Commission approved the plan for the readjustment of the financial structure of the Boston & Maine, proposed by a general readjustment committee.

July 14.—The Interstate Commerce Commission refused the rate increases sought by the western railroads, holding that no financial emergency existed in the western district to justify a general advance in freight rates.

July 14.—Charles A. Coffin, founder and for 30 years head of the General Electric Company, Schenectady, N. Y., as president and chairman of the board, died.

July 21.—The first suburban trains were operated electrically on the Chicago terminal of the Illinois Central, marking the completion of the first stage of the electrification of both freight and passenger facilities within the city limits as provided for by the Lake Front ordinance of July 21, 1919.

July 24.—The Kansas City Southern asked authority of the Interstate Commerce Commission to acquire control of the Missouri-Kansas-Texas and control of the St. Louis Southwestern by stock ownership in the latter company by the Missouri-Kansas-Texas.

July 26.—Robert T. Lincoln, president of the Pullman Company from 1899 to May 18, 1911, died.

AUGUST

August 6.—Edgar S. Bloom, formerly a vice-president of the American Telephone & Telegraph Company, was elected president of the Western Electric Company, to succeed Charles G. DuBois, elected chairman of the board.

SEPTEMBER

September 1.—E. C. Sicardi, president of the Union Tank Car Company, New York, retired.

September 5.—An eastbound passenger train on the Denver & Rio Grande Western was derailed near Waco, Colo., resulting in the death of 30 persons and the injury of 50 others.

September 6.—Five persons were killed and 50 were injured when a suburban train of the Chicago & North Western ran into the rear of a through train at Clybourn Junction, three miles from the terminal in Chicago.

September 15.—Charles H. Markham, president of the Illinois Central, was elected chairman of the board of directors, and was succeeded by Lawrence A. Downs, president of the Central of Georgia, who was succeeded by John J. Pelley, vice-president in charge of operation of the Illinois Central.

OCTOBER

October 11.—The Interstate Commerce Commission denied the application for the proposed lease of the Virginian to the Norfolk & Western on the ground that it would not be in the public interest.

October 17.—James H. McNulty, president of Pratt & Lambert, Inc., Buffalo, N. Y., died.

October 18.—The Interstate Commerce Commission announced that it would include the investigation of class rates in western trunk line territory under its general investigation of the rate structure No. 17,000 and would hold an initial hearing at Omaha, Neb., on January 11, 1927.

October 25.—The Interstate Commerce Commission's investigation into motor transportation in the United States was brought to a close at Washington, D. C.

October 28.—William G. Besler, president of the Central of New Jersey, was elected chairman of the board and was succeeded by R. B. White, senior vice-president.

October 28.—The board of arbitration began hearings on the application for increases in wages amounting to approximately 20 per cent, made by the trainmen and conductors' organizations on behalf of members employed on eastern railways.

NOVEMBER

November 12.—C. V. Burnside, assistant director of the Bureau of Finance of the Interstate Commerce Commission, recommended the proposed lease of the Lehigh & New England by the Reading as being in the public interest.

November 13.—Hearings on the application of the Kansas City Southern for authority to acquire control of the Missouri-Kansas-Texas and the latter to acquire control of the St. Louis Southwestern were brought to a close at Washington, D. C.

November 19.—The Union Pacific was awarded the E. H. Harriman gold medal for the most conspicuous accident prevention work in America during 1925, the Duluth, Missabe & Northern the silver replica and the Green Bay & Western the bronze replica.

November 22.—The Chicago, Milwaukee & St. Paul was sold at public auction at Butte, Mont., to Robert T. Swaine and Donald C. Swatland, representing the reorganization managers.

November 24.—A tax suit instituted by the state of Illinois in 1906 against the Illinois Central was ended in an agreement by the railroad to change its method of computing charter line gross receipts, pay the state $1,500,000 as the balance of taxes due since 1906, and assume the unpaid costs of the litigation.

November 25.—William Larimer Jones, president of the Jones & Laughlin Steel Corporation, Pittsburgh, Pa., died.

November 27.—The Central of New Jersey dedicated and formally opened its $14,000,000 four-track bridge over Newark Bay connecting Bayonne, N. J., with Elizabethport.

DECEMBER

December 1.—George Hannauer, vice-president of the Indiana Harbor Belt, Chicago, was elected president of the Boston & Maine, to succeed James H. Hustis, resigned.

December 1.—The Interstate Commerce Commission issued an order requiring all steam railroads subject to the interstate commerce act to institute, effective January 1, 1928, a system of depreciation accounting on the straight line basis.

December 1.—Wage increases affecting 40,000 shopmen and ranging from one to three cents an hour, were granted by western railroads including the Chicago, Rock Island & Pacific, the Atchison, Topeka & Santa Fe, the Chicago, Burlington & Quincy, the Chicago & Eastern Illinois, the Fort Worth & Denver City, the Union Pacific, the Wabash, the Illinois Central, the Great Northern and the Chicago & Alton.

December 2.—An increase of 7½ per cent in wages was granted trainmen employed on eastern railroads by the Arbitration Board.

December 10.—Charles N. Whitehead, president of the Missouri-Kansas-Texas, died.

December 16.—Frederick D. Underwood, president of the Erie, retired effective December 31, and was succeeded by John J. Bernet, president of the New York, Chicago & St. Louis.

December 16.—A plan for the readjustment of class freight rates in western trunk line territory was agreed upon by shippers and carriers at a meeting in Chicago.

December 20.—W. R. Scott, president of the Southern Pacific, Texas Lines, died.

December 20.—W. L. Ross, senior vice-president of the New York, Chicago & St. Louis, was elected president of that road.

December 20.—Columbus Haile, vice-president in charge of traffic of the Missouri-Kansas-Texas Lines, was elected president of that system.

December 20.—Cyrus E. Woods, attorney, Greensburg, Pa., was nominated a member of the Interstate Commerce Commission, to succeed Frederick I. Cox, whose term expires.

December 23.—Collision between northbound and southbound Florida express trains on Southern Railway at Rockmart, Ga.; 20 persons killed, scores injured.

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Caleton Bridge, Near Mendoza, Chile

Chilean Roads Progress Slowly

State lines, hampered by operating losses, a burden to government—Private lines good earners

By Santiago Marin Vicuña

THE railways of Chile have been built to conform to its rather peculiar geographic and topographic characteristics with the following lines:

(1) A longitudinal line from north to south, which now extends from Zapiga in the province of Tarapacá, to Puerto Montt, in the province of Llanguihue, with a length of 2,050 miles.

(2) A series of transverse lines from east to west which, following the principal valleys, start in the cordillera regions, cross the longitudinal railway, and terminate at coastal ports.

The construction of this system, with its total of 6,200 miles has progressed slowly and in proportion to the industrial needs of the country, rather than according to a set program.

From the early days until the present, state and private interests have combined to extend this railway system. The mileage is divided between state and private lines as follows:

	Mileage	Percentage
State owned	3,772	61
Privately owned	2,437	39
	6,209	100

The management of the state-owned railroad is in the hands of the President of the Republic and the Secretary of the Department of Public Works, Commerce and Communication. They, with the co-operation of Congress, manage the affairs of this important branch of national activity. But there is a supplementary body, Inspection Superior de Ferrocarriles (Chief Inspection of Railways) called in government consultation in specific cases, which proceeds in accordance with the wishes of the Consejo de Vias de Communicacion (Council of Ways of Communication), composed of men representing the country's various industries. In addition to the above, each railroad, whether state or privately owned, has its individual management which acts according to rules which, in turn, must be approved by the government.

New General Railway Law Passed

Until a short time ago all the railway legislation of the country was included in an old law, passed in 1886, called Policia de Ferrocarriles which was only a copy of the Spanish regulations passed in the embryonic period of the world's railways.

This explains the necessity of modernizing our legislation, which was completed in March, 1925. The new law, called Ley General de Ferrocarriles, is in part modeled after laws passed in countries in the lead in railway activities—such as the United States and England, and some other European nations.

In general, this law refers not only to the construction of state and private railroads, but also to their operation, and for this purpose has created two important bodies, the Inspeccion Superior de Ferrocarriles and the Consejo de Vias de Communicacion mentioned above.

In conformity with this law every railroad concession and every business having any concern with the public communication system must first be studied and considered by the two bodies previously mentioned, the Inspeccion Superior and the Consejo. In connection with railway problems only, the procedure of study is as follows:

If the problem concerns a state-owned line, the Inspeccion and the Consejo limit themselves to considering it from the economic angle and that of the public good

within a definite program of communication development. But if the problem refers to a private system, other technical formalities enter which the law consigns as follows:

For the purpose of attending to the many functions which the law gives to the Inspeccion Superior, it has been divided into three departments, as follows:

(1) The department of construction, which studies everything referring to concessions to and construction of private railroads.

(2) The department of operation, which supervises these lines in their operation with a picked staff which periodically visits the offices of private railroads and concerns itself not only with the quantity and quality of the rolling stock, etc., but also with all difficulties which arise between the management and the personnel or the management and the public.

(3) The department of finance, which studies rates, traffic contracts, accounting methods (especially of those lines which have government guarantees), compiles railway statistics and deals with the financial problems which arise daily in the administration of a railroad.

Thus it can be seen that the entire enforcement of the law is taken care of through the Inspection Superior, but, in order to divide responsibility as well as to guard the interests of the industries related to transportation facilities, the Inspeccion Superior is assisted by Consejo de Vias de Communicacion. The latter body is formed of 15 paid members who are appointed by the President of the Republic and serve for six years.

This council attends to all matters related to transportation, including the information which the government needs concerning the general plan of transportation as well as to questions of rates and the difficulties encountered in enforcing the Ley General de Ferrocarriles. As an aid the law also provides for the formation of a Fonda General de Ferrocarriles (General Railroad Fund) which is used not only to support the Inspeccion General but also aids in the development of the railroad system. The fund is made up of fines imposed in accordance with the law, of rentals paid by private railroad companies, as well as of compulsory contributions from all railroads, state-owned or private, fixed prorata in accordance with the volume of traffic.

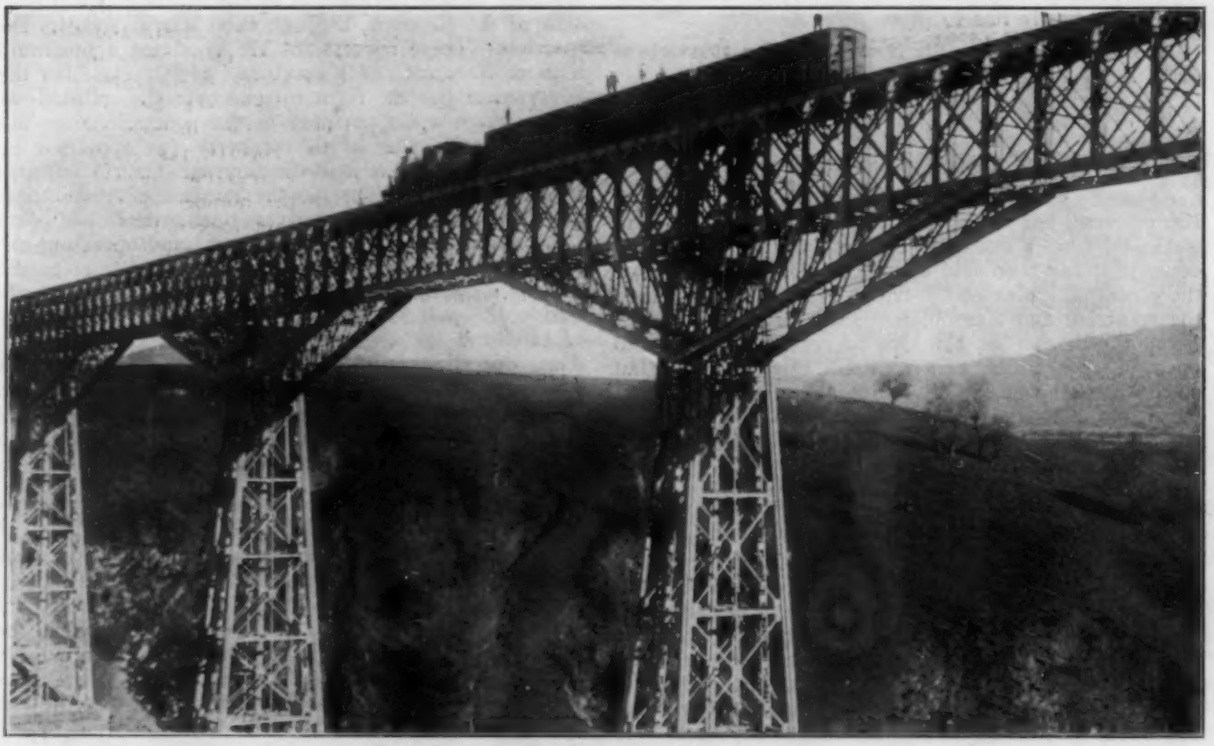
In the first year of existence the Inspeccion General had at its disposal 345,000 pesos, of which 200,000 pesos were the share of the government and the rest represented the shares of the state and private railroads.

How Government Lines Are Managed

The survey and the construction of the new state lines are undertaken by a fiscal body called the Direccion General de Obras Publicas, created in 1888.

The isolated lines from Arica to La Paz and from Ancud to Castro are managed directly by the Ministry of Communication; that from Caleta Buena to Agua Santa and its branches is rented to a private company and that from Puente Alto to Volcan is under the jurisdiction of the railway division of the War Department.

All the rest are under the direction of the state railway, except a longitudinal stretch of road 441 miles in length between Pintados and Pueblo Hundido, which is also leased to a private operator.



Steel Viaduct, Chilean State Railways

The law through which the state lines are controlled was passed in 1925 and may be summarized as follows:

The management under the supervision of the government, is in the hands of an administrative council, a general director, a sub-director and zone managers, for which the entire system is divided into sections that are more or less equal in length and traffic.

The council is formed by ten persons appointed by the President of the Republic, and is made up as follows:

The general director.
Three inspectors or financial experts who have been heads of public departments, bank directors or railroad councillors.

Two engineers who are specialists in transportation.
One head or member of the general staff of the army.
One representative of the National Society of Agriculture.
One representative of the National Society of Mining or Manufacturing.
One representative of the employees of the railroad.

The management itself is in the hands of the director and sub-director assisted by six "chiefs of service" who have charge respectively of the following departments:

Transportation.
Ways and structures.
Motive power and shops.
Personnel.
Materials and supplies.
Finances and accounting.

The above mentioned chiefs of service, as immediate aides to the director and council constitute the technical force of the management which works through the zone managers.

State Lines Lose Money

Passing to an analysis of the financial administration we will limit ourselves to saying that this is independent for the railroads to the point of their being able to contract bank loans, with government authorization to help out the receipts. The rates ought to be so calculated as not to produce deficits, but unfortunately they are not. In effect the finances have always been unfavorable, leaving deficits year after year which Congress periodically has to make good.

Averages for Last Six Years Including 1925*

Mileage in operation	4,563 kilometers (2.834 miles)
Receipts	172.1 million pesos
Expenditures	177.3 million pesos
Number of passengers	14.4 million
Tons of freight	4.9 million metric tons

*The Chilean peso is worth approximately 12 cents U. S. money.

As can be seen, the operating ratio which has exceeded 100 per cent, has left great losses which have definitely weakened Chile's financial position. On more than one occasion it has been said that all or the greater part of the economic illness of the nation is to be attributed to the recurrent and accumulated deficits of her railroads. From this has arisen the idea to rent the railroads to operating companies, expert in this class of work, but since the step would tend to place the entire management into the hands of foreign capitalists, it will not be regarded with favor until the point is reached where the deficits equal the national securities.

Electrification Progress

All the state railroads to which we have alluded use in their operation Chilean coal which is of very good quality, except the section from Valparaiso to Santiago and the branch of Los Andes, which have recently been electrified in accordance with the most modern practices. This work has been done by the American firm of Westinghouse and represents an approximate investment of $10,000,000, including the cost of locomotives and other appurtenances. The power is transmitted from the power plant of Los Maitenes in the Maio valley which also generates power for the traction and light service of Santiago, and which will soon supply power to the trans-Andean railroad connecting Los Andes with Mendoza and Buenos Aires, and which is now being electrified.

Privately Owned Railroads Fare Better

The administrative council and the government have not spared themselves in their efforts to improve operating efficiency, shop efficiency and employee relations. Still, much remains to be done. Money is always lacking for the realization of new construction programs. The state has for years been paralyzed by its poor economic situation, limiting itself to mere studies of lines which, when the opportunity in given will have to be built.

The foregoing shows that the state has undertaken the task of building railroads as costly as the one from Calera to Pintados, in which it has invested no less than $50,000,000 without other hope at the present time than that of stimulating or creating the public wealth. This proceeding naturally has not held good in the investment of private capital, which has always limited itself to constructing remunerative lines, i.e., gone into regions of intense traffic and developed resources.

This happened for example in the case of the lines from Caldera to Copiapo, Puquios and Chañarcillo, built by a private company in the year 1850; and later, because of the needs and the progress of the mining industry, in the case of the construction of the lines of Chañaral and Coquimbo built in the years 1872 and 1861 respectively. But it so happened that as soon as the mining industry died out in these regions, these railroads had to be taken over by the government and included in the northern system.

The operation of each one of these privately owned railroads is in charge of separate and independent managements, but under the supervision of the Inspeccion Superior, as mentioned above, not only in the matter of its rules, but also in its rates.

The control of the government concessions of these privately owned railroads is in the hands of the President of the Republic, through the Consejo and the Inspeccion. These concessions are good for a minimum term of 30 years and a maximum of 90 years, but the government has the right to take over the railroads at any moment upon payment to the concessionaires not only the real value of the property (as appraised by the parties concerned and the Supreme Court) but also an amount proportional to the number of years these have held the road. The private lines in 1925 had operating revenues of 167.4 million pesos and operating expenses of 108.4 million pesos, in great contrast to the returns shown by the government lines. These roads during the past six years averaged operating revenues of 140.8 million pesos and expenditures of 99.5 million. Their operating ratio has averaged 70.7 per cent, while that given for the state lines has exceeded 103 per cent.

In the operation of the private roads, fuel oil is used on nearly all northern roads and coal on the southern ones—except for the electrified parts, which total a bare 43 miles.

International Railroads

Among the lines mentioned above, there are three that are international in character. These are: the Arica-La Paz, the Antofagasta & Bolivia and the trans-Andean, of which the first is government-owned while the other two are private. The last, however, has a subsidy of £75,000. The principal characteristic of these lines lies in their excessively heavy grades, caused by the fact that all three of them cross the Andean Cordilleras on the Bolivian and Argentinian boundaries.

Performance of Chilean Railways (State and Private) in 1925

Passenger carried	43.8 million
Metric tons of freight handled	12.3 million
Passenger receipts	72.3 million pesos
Freight receipts	324.9 million pesos
Freight cars in service	18,000
Passenger cars in service	2,000
Locomotive cars in service	1,500
Number of employees	40,000*

*Of the last, 27,000 are employed by the State Railways and 13,000 by the private railways.

In order to arrive at the "constructive value" of this system (different of course from the commercial value) we have procured cost figures for 1,200 miles of various gages and have thus arrived at average unit prices, according to which the total value of all the railways is $314,500,000.

Argentina, Brazil, Uruguay

Railways on the whole do well and continued construction activity planned

By W. Rodney Long

OUTSIDE of proposed new railway construction programs, there were few important railway developments in Argentina practice during the last year. Some attempt was made to consolidate the floating debt of the State Railways, but no action was taken. It is expected that this program will be accomplished during the coming year. Railway receipts for the fiscal year showed an increase over 1925 but declined during the first half of 1926. The railways have made many concessions to the agricultural interests in grain rates. Free storage space was offered as well as a reduced freight rate on corn and oats. The subway extension question in Buenos Aires still remains unsettled although indications point to a satisfactory solution in the near future.

New Construction

Practically all railway companies are planning new construction in the near future. The Central Argentine

São Paulo Station, Brazil

has several projected extensions. There is an extension projected from Villa del Rosario, Province of Cordoba, to Garza, Province of Santiago del Estero—a distance of about 270 miles. This line will give direct access between the important city of Cordoba and the northern provinces and open up an important zone. Other extensions are from La Ramada to Rosario de la Frontera (100 miles); and from Hersilia, Ceres, or Selva to Parallel 28 (130 miles). All these new lines, it is said, are located in areas which only await adequate means of communication in order to bring further vast tracts of land under the plough. In addition to the new lines just mentioned, the Central Argentine proposes to extend the electrification of its suburban lines from Maldonado Junction to Villa Ballester, and from Coghlan Junction to Tigre.

The Buenos Aires Great Southern has plans for the construction of about 220 miles of branch lines in the Province of Buenos Aires. The lines to be built are from Azul to a point on the Tres Arroyos Bahia Blanca line, in the partido of Coronel Dorrego (this branch will cross the line from Olavarria to Vela in the vicinity of Chillar station to continue in a southwesterly direction to Juan E. Barra station); extension of the branch line from Tandil to Napaleofu towards the south until it links with the main line near Loberia; and the construction of a branch line from San Vicente station to the town of the same name.

The Buenos Aires Western expects to complete its new Caleupu branch the early part of the year. In the western part of the country the Buenos Aires & Pacific has already constructed several branches in the Provinces of San Juan and Mendoza and contemplates the construction of several more branches in this territory.

Renewal of work on the new Argentine-Chilean transcontinental line from Salta to Antofagasta is expected to commence shortly. The construction of the Argentine portion of the line reached Puerta de Tastil and stopped. The only work of importance done since then has been the completion of all tunnel work as far as the Abra de Chorrillos. Grading is ready for some 80

miles ahead of the present rail-head and there has been finished a little more than 70 per cent of the work, as regards cost. The amount of heavy grading, tunnel and viaduct work to be completed is small, although the heaviest bridge on the line is yet to be constructed. This bridge is the Munal viaduct, 787 feet long and 246 feet high.

The Chilean government has approved the Barros-Jarpa, Noel treaty which calls for the initiation of the work on their section as soon as this treaty is ratified by the Argentine Government. Whether the terms of this treaty will be carried out or not is uncertain.

It is also reported that the Ministry of Public Works has submitted a project to the Legislature for the addition of new branches to the Provincial Railway and the construction of large shops at La Plata for the maintenance of rolling stock. The railway branches proposed means the laying of more than 600 miles of track, with the main line extending to the city of Bahia Blanca. It is estimated that the branches will require an expenditure of approximately 17,000,000 gold pesos (approximately $6,800,000). The necessity for this immediate construction is due to the requirements of the interior towns. It is understood that numerous banking houses have offered their facilities for the financing of this program.

The Northeast Argentine proposes to construct an 80-mile line of standard gage as the first section of a proposed railway for the Misiones territory as specified in Law 6712 of 1909. The proposition made is not an unconditional tender to finance the work, but is rather an offer to carry on the construction for government accounts. The costs of this construction are to be defrayed by the sale of government lands along the right-of-way.

Brazilian Railways

Brazil now has in operation 30,636 kilometers (19,125 miles) of track of which amount the government owns or operates 23,267 kilometers and the state governments 7,369 kilometers. The gages of the various lines are as follows:

27,661	kilometers of meter
1,809	kilometers of 1 meter 60 cm.
733	kilometers of 76 cm.
800	kilometers of 66 cm.
424	kilometers of 60 cm.

One can now travel from Victoria in the State of Espirito Santo on Northern Minas Geraes to the boundary lines of Uruguay and Argentina, a distance of 2,100 miles. The journey is replete with breaks, however, due to the varying gages.

Construction

The Itapemirim Railway, leased in connection with the Usina Paineiras (a state-owned sugar mill) has been poorly maintained, presenting a considerable deficit. During recent rains it suffered much damage and traffic has been interrupted for some time. An appropriation for the repair of the road and acquisition of material is to be requested from the legislature.

The government commissioned an engineer of recognized ability to study the feasibility of constructing a railway between Victoria and Santa Cruz. He estimated the cost of construction, exclusive of rolling stock and bridges, at 2,500 contos.

No steps toward the realization of the Littoral Railway were taken during the year. It is an old project, having in view the linking of Victoria with the south by a railway along the coast.

The proposed line of the Eastern Railroad of Brazil from Arassuahy to Tremedal has been changed and will run from Theophilo Ottoni to Figueiras. The contract for this work has been awarded to the Compagnie des Chemins de Fer Federaux de L'Est Brazilian. The estimated cost of the line is about $1,000,000 (6,270,459 milreis).

Finances of the State of Rio Grande do Sul Railways

The State Railways of Rio Grande do Sul now have a total mileage of 1,600 all of one meter gage. During the year 1925 the Railways showed a large increase in gross receipts over the year 1924. The increase was general in all gross receipts, no particular traffic being responsible.

During that year freight rates were increased 10 per cent on express, baggage, farm products and unfinished material and increased 20 per cent in nearly all manufactured articles and products other than raw material. During the fall of 1926 the rates were further increased.

Uruguayan Railways

Uruguayan railways during the fiscal year ended June 30, 1926, showed an increase in net revenue of from £741,642 in 1925 to £770,614 in 1926. Before 1917 there were seven British railway companies in Uruguay, but during that year the government purchased the Uruguay East Coast Railway. During the same period the mileage has remained constant. There are 1,314 miles of track in operation. The dividends paid during the year were the same as for the fiscal year June 30, 1925, 6.1 per cent.

One of the subsidies under which the Railways are operating expired and others are due to be terminated in the near future. In spite of that fact, the North Western of Uruguay Railway, which was the road to suffer a deficit in its subsidy, showed an increase of over £12,000 in its net revenue.

New Projects

During the year the National Administrative Council presented two projects for improved transportation service between Montevideo and Buenos Aires via Colonia —one by building a new railroad at a cost of $12,500,000 with English capital and the other by the construction of an auto highway costing $6,000,000 with American capital. Both involve a fast ferry service between Colonia and Buenos Aires.

Freight Rates

Some trouble developed over the high freight rates charged by the Central Railway of Uruguay. It was claimed that its tariffs and earnings were excessively high. In refutation of this claim, the railway published a statement showing that its dividend earnings on its common stock were only 3.994 per cent over the period 1878 to 1925.

Market for Railway Materials

The market for the sale of railway materials or equipment is poor. This is due mainly to the fact that the British-owned railways purchase through their London offices and, except for a few minor supplies of emergency character, there is no opportunity for sales. That material is being sold there, however, can be seen from the innumerable tenders which have been asked by the railways.

The Lord Nelson, a New Southern Railway Passenger Locomotive

Britain's Hopes Spoiled by Strike

Conditions favorable first few months of year—Workers admit strike was great mistake

By W. H. Fraser, M. Inst. T.
Publicity Agent, Great Western Railway

THE story of British railways in 1926 is a sorry one. It is a tale of continuous heavy losses in revenue, unprecedented unemployment among railwaymen, and the depletion of railway trades unions' funds. What a different tale it might have been! The spade work of 1925 in reviving industry was bearing fruit, and passenger and freight traffic on the railways were showing gratifying increases. In seventeen weeks the revenue of the four big railway groups increased by £1,054,000 and from the advance bookings at holiday resorts there were indications that passenger traffic would exceed all previous records. The revival of industry was clearly reflected in the freight traffic returns, which steadily increased week by week, at a dull time of the year, and removed the pessimism which existed as to railways not being in a position to hold the fort against highway competition.

But the Strike Spoiled It All

The outbreak of the general strike on May 1 was followed by immediate and heavy financial losses, and the prolongation of the miners' strike, which lasted for thirty weeks from May 1 to the end of November, completed the financial debacle, and at the time of writing one-seventh of the revenue from the four groups has been irretrievably lost.

Never before has it been necessary to tell a tale of such incredible folly on the part of railwaymen. Throughout the world British railwaymen have a reputation of being as reliable, steady and sane as in any industry. Their records of work proves it. Yet by their own act they deliberately destroyed their means of livelihood and wrought their own discomfiture. J. H. Thomas, the railwaymen's leader, stated at the Trades Union Congress in October, that 45,000 railway employees had not done a day's work since the beginning of May, and 200,000 more were working only three days a week.

There was no real grievance. The conditions of service had been enormously improved of recent years, and in 1919 the railwaymen were afforded protective measures for their conditions of employment which caused other trades to speak of the railway as a sheltered industry. Their agreements with the companies were incorporated in the Railways Act of Parliament in 1921, and they had the right to discuss their grievances in public, before the National Wages Board. Yet the railwaymen's leaders chose to treat the agreements as "scraps of paper."

Why Did They Strike?

What then, was the cause of this midsummer madness? Misleading propaganda was the source of the railwaymen's defection and in the case of the peace lov-

ing worker, fear of the millions of workers banded together to take part in the general strike. For two decades the general strike had been talked of at the branch meetings of the railwaymen. It was to be the millennium for all workers and followed by a time of perfect government, when grievances would be instantly remedied. Allied to that belief was the insistent rumor that the railway companies were plotting to reduce wages and lengthen hours. Finally, there was a plea that it would help the miners. Nothing was farther from the truth. It is now a matter of history that miners, railwaymen and every other striker were badly advised. We also now know that the strike was directed against the state, but it is not the purpose of this review to deal with the political aspect of the question. The railwaymen placed blind faith in their union leaders, before their duty as public servants, and trusted employees of the companies. They even disregarded the use of the ballot box, their inalienable right under union rules. The result was that they found their faith had been misplaced, and has since brought them untold losses.

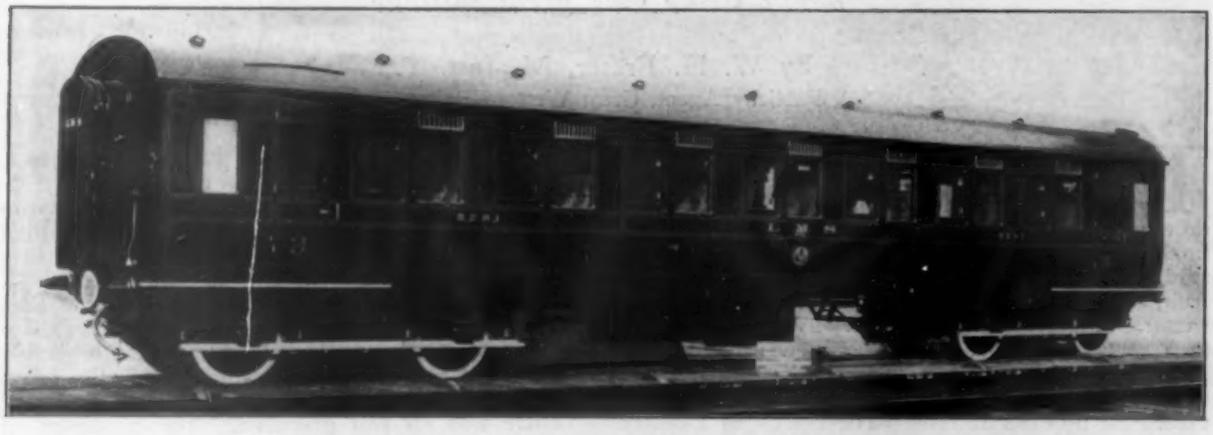
The Strike and Terms of Settlement

The story of the actual railwaymen's strike has already been told in the *Railway Age* so far as it related to the London & North Eastern (see issue of June 26, page 1961). The measures taken to cope with the strike on that railway are precisely similar to those of the other groups, the Southern, Great Western, London Midland & Scottish and the London Underground. British railways work in unison in these matters, and to repeat the story would be wearisome. The railway strike may be summarized as part of an effort to paralyze the nation. The nation accepted the challenge and the strike ended in the most gigantic failure in the history of trade unionism. It also laid low the bogey of the general strike.

It had been an accepted theory amongst railway workers that when a strike was over "one back, all back" and the strikers left their work in the expectation that the usual procedure would be followed when the general strike was called off, but the injury to trade was too serious to expect the flow of traffic to be normal, and as events have proved there was no possibility of finding work for all the men who presented themselves for duty. The government publicly announced that it had no intention or power to compel employers to take back every man who had been on strike and endorsed the view that the reduction of business was inevitable through the upheaval. Though the unions attempted to force the issue by instructing their members to continue the stoppage, their efforts failed, and they entered into negotiations with the railway managers which resulted in the production of an agreement which is destined to be historic.

In the confusion which attended the general strike, and the comparative absence of news services, the significance of the railway settlement was never fully realized. For the first time in railway labor troubles it drew from the trade union leaders the admission that they committed a wrongful act in calling the strike. It is known that such an admission was not made without full argument on the part of the railwaymen's leaders, but such an admission was due to the railway companies and credit must be given to the railwaymen's leaders in acknowledging their error in a written document as it was not an easy matter to explain to their followers. The firm stand taken by the general managers shows evidence of good statesmanship. It enabled them to restore perspective which has been unduly distorted of late years. Railway men who were willing to listen to reason saw that their first duty was to safeguard the interests of the company, with the possibility of wrecking their careers as an alternative. If further proof of the value of the settlement were needed it is to be found in the national character it speedily assumed, as it was used as a basis for the settlement of the disputes in other industries. There has been no victimization, despite the efforts that have been made to induce the country to believe that it existed. Finally, in fairness to the men it must be recorded that their behavior was good throughout the strike except in a few isolated cases.

A Typical Suburban Station on the London & North Eastern



A Third-Class All-Steel Vestibule Car on the London, Midland & Scottish

Financial Position

And what of the cost? The total loss in gross railway revenue as a result of the general strike was £6,490,000 divided up among the four groups as shown in Table 1.

By the middle of November the disastrous effect of the miners' strike had quadrupled these losses (I quote from the official traffic returns). The latest figures give the traffic returns to November 14, 1926, and are shown in Table 2.

Table 1—Gross Railway Revenue. 1926 Compared with 1925

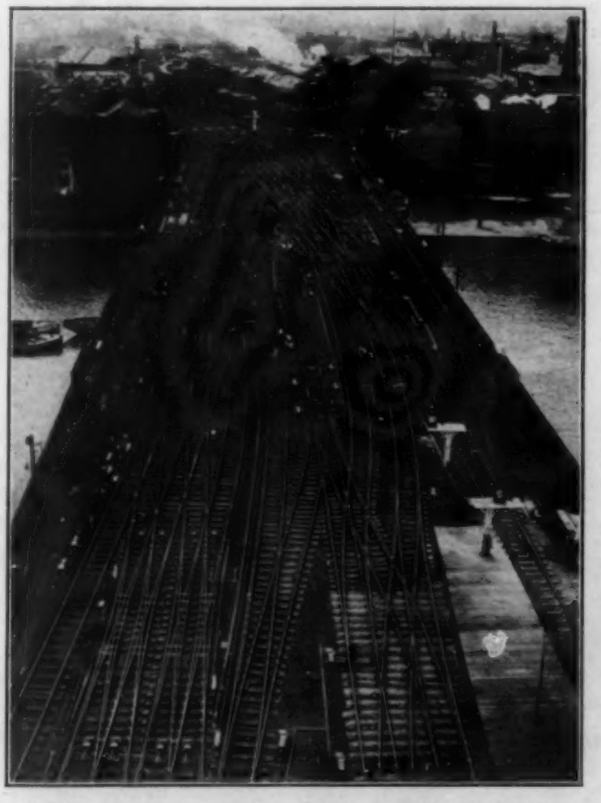
Railway	Increase to May 1 £	Decrease to May 23 £	Loss due to Strike £
G. W.	280,000	735,000	1,015,000
L. M. & S.	136,000	2,624,000	2,760,000
L. N. E.	500,000	1,622,000	2,122,000
Southern	138,000	455,000	593,000
	£1,054,000	£5,436,000	£6,490,000

It should be realized that the traffic returns for 1925 were £3,794,000 lower than 1924, so that in comparing with the revenue two years ago the total decrease in revenue is to date even greater than the above figures show.

It is important to note that though the gross revenue lost has amounted to such a huge sum, there have, of necessity been considerable curtailments in expenditure. It is obvious that with numbers of railwaymen unemployed, and thousands more working short time, there is a set-off against the losses. Slackness of trade and shortage of money have also necessitated the diminution of freight and passenger services, but most of these savings have been discounted through the enormous increase in the price of coal, which has to be shipped from Europe, South Africa and America, in sufficient quantities to maintain the railway services. The price of locomotive coal in April, 1925, averaged between 21 shillings and 22 shillings a ton. In April, 1926, it had fallen to an average price of 21 shillings, the saving being due to the government subsidy. The strike accounted for a sharp rise to 34 shillings, then to 38 shillings, 8 pence, and the existing price varies from 70 shillings to 80 shillings per ton. Taking an average price of 75 shillings the railway companies are paying 54 shillings a ton above the April figures. It may be thought that the losses of the railways would have a profound influence on the price of railway stocks and shares, but Table 3 indicates that the British Stock Exchange is very properly hoping that the savings in expenditure will save the financial situation.

Table 2—Aggregate Traffic Returns—45 Weeks to November

	Passenger Mails & Parcels		Merchandise & Live Stock		Total		
	1926 £	1925 £	1926 £	1925 £	1926 £	1925 £	Decrease £
G. W.	10,876,000	12,179,000	11,576,000	14,605,000	22,452,000	26,784,000	4,332,000
L. M. & S.	25,064,000	28,752,000	30,693,000	38,070,000	55,757,000	66,822,000	11,065,000
L. N. E.	17,753,000	20,027,000	22,856,000	29,853,000	40,649,000	49,880,000	9,231,000
Southern	14,468,000	15,497,000	4,504,000	5,272,000	18,972,000	20,769,000	1,797,000



A Few Crossovers on the Southern Railway, London

Improvements in 1926

After the tale of losses, the story of developments makes a brighter picture, though work has been severely curtailed. The strike found the Southern Railway on the verge of completing its great suburban electrification scheme, the full electrified service of the last section in North Kent being brought into operation in July, 1926, concurrently with the augmented summer service. The complete Southern electrification scheme involved the conversion of 647 miles of track from steam to electric traction. The lines affected are better known to railwaymen under their old company titles:

Table 3—Prices of British Railway Stocks

	Lowest 1925	Price Nov. 16th 1926
Great Western Cons. Ordinary	82½	89½
L. N. E. R. 5% Pref. Ord.	53⅛	50½
L. M. S. Ord.	71	73½
Southern Pref. Ord.	71¾	78

London & South Western Section	245 miles
London, Brighton & South Coast Section	152 miles
South Eastern & Chatham Section	250 miles

The cost of the work is approximately £8,000,000 and the Southern can now claim possession of the largest suburban electric service in the world, serving a huge area densely populated with London's workers. On the South Western and South Eastern sections direct current at 660 volts is used, with positive conductor rail and running rail return. On the Brighton section overhead conductors are used, with high tension alternating current at 6,000 volts. The difference in the system of electrification involves the working of the electrical services on this section independently of the other two sections. Had amalgamation been undertaken before the war this difficulty would not have arisen. The management is now faced with the problem of converting to ordinary direct current system, a task it is fully alive to.

On the London Underground system "City" tube extensions in South London, from Clapham Common to

Morden, together with the provision of a connecting link from the "City" Line at Kensington to the Edgware and Highgate tube at Charing Cross were opened in September. The extensions have given London valuable alternative route facilities between North and South, and opened up a new residential district lying between Clapham and Wimbledon.

The extension and connecting link between them measure some 7½ miles in length, and together they have involved an expenditure of nearly £5,000,000. The completion of the new lines has given the "Underground" the distinction of having the world's longest railway tunnels, the continuous length of "tube" being 16½ miles via the "City" line and London Bridge and 15 miles via Charing Cross.

Friendly rivalry in locomotive building has prompted the Southern Railway to produce a new passenger locomotive, the "Lord Nelson," which it announces has a tractive power of 33,500 lb. at 85 per cent of the boiler pressure. Other express locomotives in service are Great Western "Castles" class (tractive effort 31,625 lb.) and London & North Eastern "Pacific" (tractive effort 29,835 lb.).

The London & North Eastern has completed some useful bridge conversions in the East Anglian sections of its undertaking, electrically controlled swing bridges being substituted for a much older type. Arising out of the miners' dispute some of this company's locomotives and also a number on the L. M. & S. line have been converted from coal to oil burning. The London & North Eastern has produced a standard type of tank locomotive for suburban trains and introduced long distance Pullman (parlor-dining) car services on an extensive scale.

On the Great Western new methods of handling coal traffic have been introduced in South Wales to facilitate transport from colliery to port and avoid congestion at the docks. A new series of "Castle" class express passenger locomotives commencing with the number 5000 and fitted with an enlarged tender is also being turned out from Swindon shops, and some notable high speed running has been performed by these engines, particularly on the occasion of the visit of the American members of the International Hotel Alliance, who were hustled from Plymouth to London in record time on April 9, and the record run to Birmingham with the Australian cricketers returning home via Liverpool.

Up-to-date facilities have been provided by the Great Western at its Riverside freight terminal at Brentford (Middlesex) for the handling of all classes of merchandise conveyed in barges to and from that station and steamers in the lower reaches of the Thames. To further encourage the carriage of freight by rail, the company has in hand the reconstruction of the huge freight terminals at London (Paddington) and Bristol, and when completed these will be among the most up-to-date in the world.

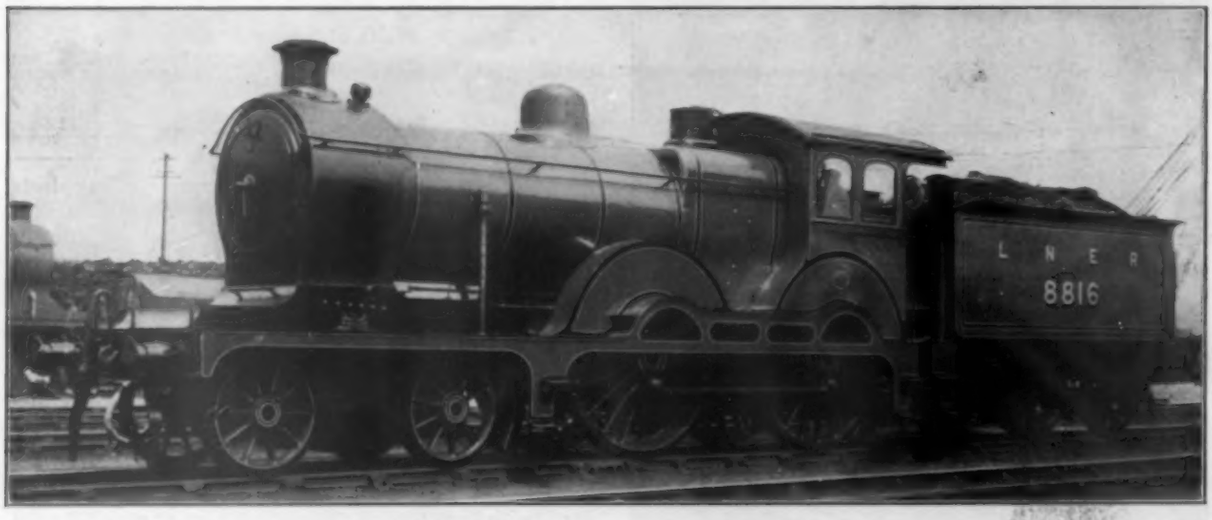
Rolling stock developments have held pride of place on the London, Midland & Scottish. New "mixed traffic" superheater locomotives, capable of hauling either fast freight or heavy excursion trains, of the "Mogul" (2-6-0) wheel arrangement have been built at Horwich and Crewe, and the program provides for the construction of 100 of these locomotives. All-steel center-corridor trains have also been inaugurated by this railway, and 80-ton cars, carried on four 8-wheel trucks, for dealing with loads of exceptional weight, represent a noteworthy advance in car construction.

Although not so pronounced as in the case of the English companies, a reduction in revenue has also taken place on the Irish railways, due partly to trade depression and partly to highway competition. The latter is making itself felt more particularly in the North of Ireland as shown in Table 4.

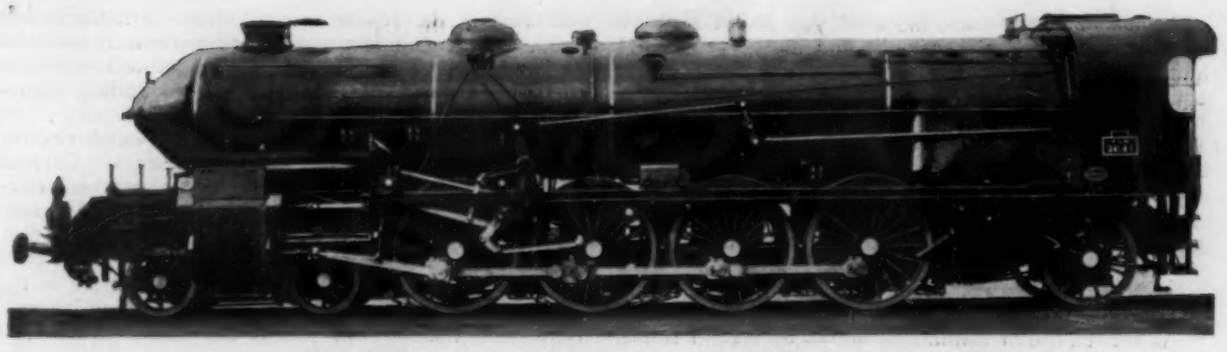
To the Great Southern Railway, the largest Irish system, must be given the credit for introducing this year the first Pullman cars in that country.

Table 4—Traffic Returns, Irish Railways—Aggregate for 45 Weeks to Nov. 12

Railway	Passenger Mails & Parcels 1926 £	Passenger Mails & Parcels 1925 £	Merchandise & Live Stock 1926 £	Merchandise & Live Stock 1925 £	Total 1926 £	Total 1925 £	Decrease £
Belfast & County Down	133,432	180,850	40,907	49,756	174,339	230,606	56,267
Great Northern	700,750	782,080	718,700	798,750	1,419,450	1,580,830	161,380
Great Southern	1,728,507	1,760,163	1,940,897	1,989,065	3,669,404	3,749,228	79,824



An Oil-Burner on the London & North Eastern



A Mountain Type Passenger Locomotive on the P. L. M.

Unstable Money France's Problem

Railways now earn all charges but task made difficult by unstable franc—Improvement program slowed up

By M. Péschaud

General Secretary, Directing Committee, Great French Railway Systems

OPERATIONS by the large French railway systems in 1926 were again rendered extremely difficult by the grave monetary situation. On January 1, 1926, the dollar in Paris was worth 26.52 francs. On November 27 it was worth 27.77 francs but, during the intervening period, it went as high as 49.24 francs—hence an increase in prices, an increase in wages, an increase in rates, an increase in the interest charges. Who does not see how the administration of the great railway systems would be embarrassed in an era of such instability?

Happily the economic and industrial situation has remained favorable up to the present time, but for several weeks an economic crisis has been feared and this eventuality, if it should take place, certainly would not make any easier the task of the railways.

Work undertaken in 1918 to increase the safety of operation has been continued during 1926. Among these improvements, the railways have actively pursued the installation of the block system to lines not so equipped, the application of repeating signals on the locomotives and of the train dispatching system on several lines of heavy traffic. The total units of rolling stock and motive power, with comparisons, are shown in Table 1.

Table 1—Locomotives in Service

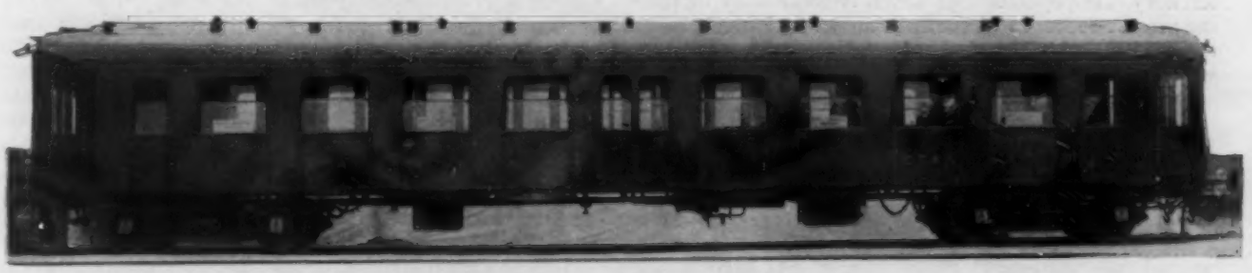
Line	January 1, 1926 Steam	Electric	Motor Cars	Jan. 1, 1914 Steam	Increase per cent
Northern	2,934	....	10	2,350	25
Eastern	2,434	....	....	1,899	28
P. L. M.	5,319	....	18	3,560	49
P. O.	2,726	18	39	2,105	29
Southern	1,193	51	67	1,061	12
A. L.	1,775	....	7	1,159	53
State	4,111	36	113	2,869	43
Total	20,512	105	254	15,003	37

Freight Cars

Line	January 1, 1926	January 1, 1914	Increase, per cent
Northern	92,555	81,029	14
Eastern	81,148	60,734	35
P. L. M.	135,930	105,568	28
P. O.	61,923	46,237	33
Southern	33,308	30,107	10
A. L.	48,486	29,628	64
State	81,882	61,606	33
	535,232	414,907	27

Table 2—Monthly Car Loadings (in thousands)

	1923	1924	1925	1926
January	55	57.9	61.3	60.8
February	54.4	61.6	63.3	66.1
March	56.9	63.2	63	67.3
April	54.9	59.1	59	63.1
May	54.2	59.7	59	62
June	56.7	59.6	59.7	64.8
July	55.1	58.7	58	61.4
August	55	60.3	60.1	63.5
September	57	62.8	64	64.6
October	60.5	65.4	66.5	67.9
Monthly average	55.9	60.8	61.3	65.1



Third-Class Steel Coach on the State Railway

As for passenger cars, the total was 31,504 in 1914 (not including Alsace-Lorraine) and in 1926 this total amounted to 35,326 for all the systems. Passenger equipment has been noticeably rejuvenated and the number of seats per car has been greatly increased since 1914. Monthly statistics of car loadings for all the seven systems (up to and including October, 1926) are shown in Table 2.

It will be recalled that the substitution of electric for gas lighting has been completed for cars likely to be used normally in express passenger trains. The trials commenced in 1922 of radio-telephonic communication with trains en route have been continued with success.

As for the use of continuous brakes on freight trains, the French railways have participated in comparative tests of several systems of brakes undertaken by the International Railway Union. The brake which appears to present to them the greatest advantages is the Westinghouse.

Electrification

Electrification has made marked progress during the year. As is generally known, the State system, the Southern, the P. L. M. and the P. O. have embarked on a vast electrification program comprehending about 5,500 miles and involving the expenditure of more than five billion francs.

On the P. L. M. this program is made up of two distinct parts: In the first place, the Parisian suburban territory, the population of which is continually increasing; in the second, that part of the system lying between the territory around Lyons and the Mediterranean coast, which is enormously endowed with water power resources.

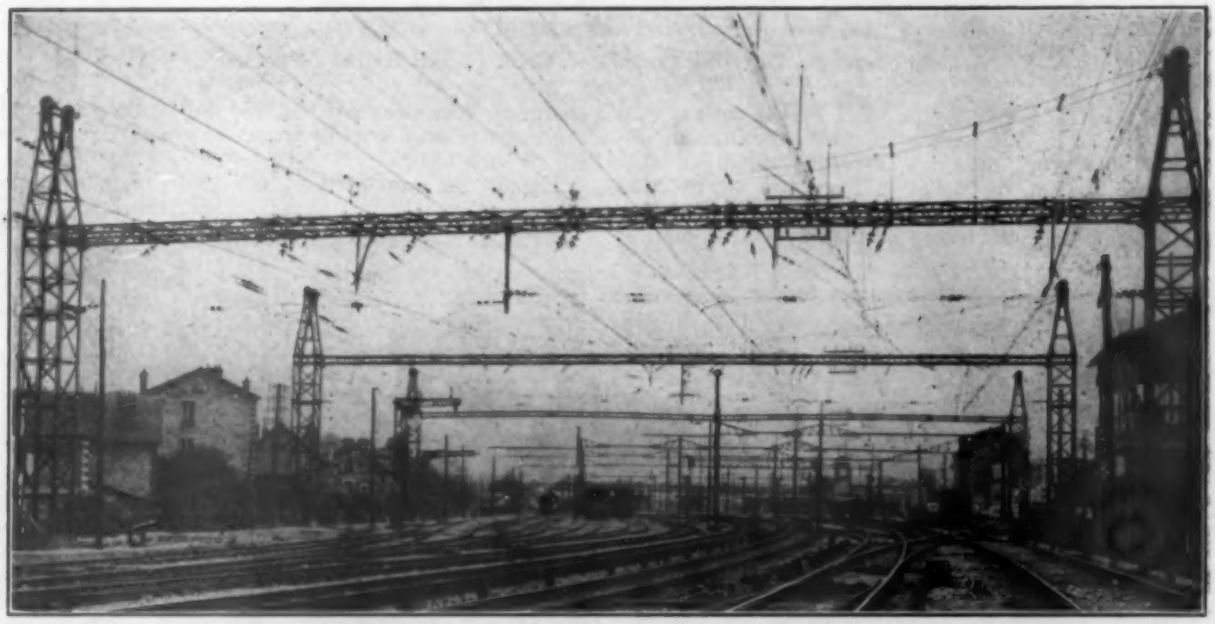
The locomotives will be of two types—the first capable of hauling unaided a 500-metric-ton express train from Culoz to Saint-Jean-de-Maurienne, in the Alps, the second able to handle an 800-metric-ton freight train under the same conditions. A maximum speed of 68 m.p.h. is expected of the first and of 50 m.p.h. for the second.

Finally, the P. L. M. will undertake additional electrification in the region around Nice—particularly between Cannes and Menton. In proportion as financial resources permit, the work will be pursued throughout the entire extent of this system. Excluding suburban lines, 1,860 miles will thus be electrified.

On its part, the P. O. has already placed electric trains in service between Paris and Orleans. Current used is of 1,500 volts. Before the end of the year electric trains will be running between Paris and Vierzon, 127 miles, which will mark the achievement of the first phase of the P. O.'s electrification program—which electrification will then be pushed on as far as Brive in the direction of Toulouse. The electrical operation between Paris and Vierzon will permit the saving of 140,000 metric tons of coal in 1927.

The new method of traction will necessitate the placing in service of high-speed electric locomotives of more than 3,000 or even 4,000 h.p., which will mean considerable improvement over the most powerful steam locomotives now in service, of which the horsepower never exceeded 2,200. The application of the results of technical research has permitted the securing of equipment of an efficiency and a factor of safety never before attained in France.

On the Southern Railway, which is to electrify 1,990 miles of its total of 2,580, electrification of the Montréjeau to Luchon line has been completed and electric operation of the line from Bordeaux to Hendaye will soon commence. About 300 miles have been electrified on this system.



Overhead Construction on Electrified Line

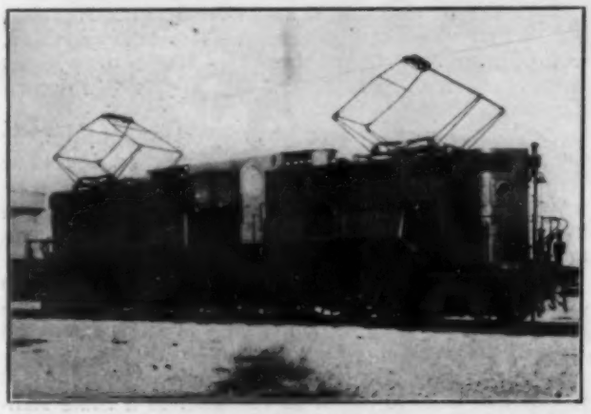
Finally, the State Railway is pursuing actively the electrification of its suburban lines.

Unfortunately the railways are finding it increasingly difficult to secure capital. The interest rate at the present time exceeding 12 per cent, the railways are being forced to slow up if not suspend the completion of their electrification program. The P. O. has calculated that electrification ceases to be profitable for it when the interest on borrowed capital exceeds 8 per cent. This is why it waits for better times for pursuing its electrification.

Independent of the progress in improving old lines the construction of certain new lines has been continued

or undertaken in spite of the increase in the cost of materials and labor—notably those across the Vosges and the Pyrenees. In every case, however, the pace has been slightly slowed up by reason of the restriction of the credits placed at the disposal of the companies.

In conformance with the program of economy instituted by the government the Minister of Public Works has decided henceforth to postpone work relative to new lines which have only a local interest and which require



High Speed Electric Locomotive on the Paris-Orleans

amounts which cannot be obtained without endangering the prompt completion of new lines already undertaken.

Rates

Taking into consideration the continuous increase in the cost of living during the year 1926 the railways were led to adjust the wages of their employees in a corresponding measure; this increase totaled 25 per cent in 1926. Thus, in order to meet this increase in expenses as well as the increase in the price of coal and supplies and the increased cost of borrowed capital, the railways were obliged to demand three increases in their rates during the course of the year—on January 1, on May 1 and, finally, on August 16.

The total of the increase in rates as compared with 1914 has reached 240 per cent for passenger service and 320 per cent for freight. In passenger fares this increase has extended without exception over all classes of rates, but for freight traffic concessions for the benefit of foodstuffs, fertilizer and newspapers have been maintained.

During the course of the year the government levied 1,500,000,000 francs additional taxes on transportation —this sum being raised by a 32.5 per cent tax on passenger fares and 11.5 per cent on freight rates in both fast and slow service. Table 3 indicates for France and principal foreign countries the index number of actual railway rates compared with those of 1913 (latest increases included, but not transportation taxes).

In other words France, with Belgium, is one of the countries where rail transportation is cheapest compared with pre-war gold prices. Therefore it is not strange that the latest increases in rates have exercised but a very light influence on the volume of traffic.

Table 3

(INDEX 1913 = 1)

Countries	PASSENGERS Index compared with pre-war rates		FREIGHT Index compared with pre-war rates	
	In paper currency	In gold	In paper currency	In gold
France	1st Class $3.40	$0.48*	$5.88	$0.84*
	2nd "			
	3rd "			
Belgium	1st Class 4.78	0.66	6.75	0.94
	2nd " 4.84	0.67	....	....
	3rd " 4.64	0.65	....	....
Germany	1st Class 4.64	1.33	6.75	1.40
	2nd " 4.64	1.46	....	....
	3rd " 4.64	1.49	....	....
Italy	1st Class } 3.25	0.62	Avg. 4.50	0.85
	2nd " }			
	3rd " 3.00	0.57	....	....
Switzerland	3.00	1.62	1.62	1.62
Spain	1.15	0.95	1.15	0.95
Great Britain	1.50	1.50	1.50	1.50
Netherlands	1.90	1.89	1.83	1.82
Norway (average)	2.58	2.10	Avg. 2.40	1.95
Sweden (average)	1.90	1.88	Avg. 2.00	1.98
Austria	14,000	1.00	15,500	1.10
U. S. A.	1.49	1.49	1.55	1.55
Poland	1.49	1.30	1.55	1.03
Czechoslovakia	5.00	0.80	....	1.20

* Gold figured on basis of 175 frs. to the £.

Table 4

In Millions of Francs.

Railway	1925 Revenue	1925 Expense	1925 Interest and operating premiums	1925 Surplus or deficit	1926 (Estimated) Revenue	1926 (Estimated) Expense	1926 (Estimated) Interest and operating premiums	1926 (Estimated) Surplus or deficit
Northern	1,594	1,264	374	— 45	2,066	1,573	429	+ 64
Eastern	1,443	1,158	270	+ 15	1,775	1,293	312	+ 170
P. L. M.	2,804	2,221	578	— 6	3,680	2,590	740	+ 350
P. O.	1,339	1,200	380	— 240	1,703	1,374	422	— 90
Southern	642	543	193	— 94	842	6,174	237	— 12
A. L.	796	664	103	+ 29	985	820	113	+ 52
State	1,486	1,452	302	— 269	1,966	1,691	343	— 68
Total	10,103	8,503	2,211	— 610	13,017	9,955	2,596	+ 466

But since, in France, the co-efficient of increased rates in paper francs has been but 3.4 for passenger service and 5.9 for freight service, while the increase in railway expenses reaches about the co-efficient 6.4, it is not surprising that the first five years of operation of the systems have closed with a deficit, as will be recalled.

Personnel

The average number of employees up to January 1, 1926, for all the systems (including the Alsace-Lorraine) was 508,000 (of which 440,000 were regular employees). This is 19 employees for each mile operated. Wage payments amount to 5,510,979,000 francs, or 54 per cent of the total receipts. As was indicated above, the principal railway systems undertook on two occasions during 1926 measures to ameliorate the material well-being of their employees by a general increase in wages and salaries. Both of these increases were 12.5 per cent, or 25 per cent all told—embracing wages, allowances and premiums. The added expense to the railways is about 650,000,000 francs, which brings an increase of about 500 per cent in the wage per employee since 1913

Interlocking Tower at St. Denis

with an increase of 660 per cent in total labor costs. Operating results are shown in Table 4.

On January 1, 1926, the capital obligations of all the large railways including the capital of the old Western Company, purchased by the State, reached 34,600,000,000 francs. Sinking funds totaled 8,400,000,000 francs. The increase in weekly receipts for the railways taken together is steady.

Of these receipts 25 per cent are from passenger service, 12 per cent from high speed freight service and 63 per cent from slow freight. Passenger business has increased by 40 per cent since 1913 and freight traffic by 16 per cent.

The Financial Equilibrium

For the first time since the new railway regime was instituted in 1921 the large French railways succeeded in 1926 in equalizing their receipts and their charges. In the transitory period of six years from 1921 to 1926 the financial equilibrium of the railways was merely optional and recourse to borrowing was permitted. Indeed the deficits have been:

In 1920	2,973	million	francs
1921	2,141	"	"
1922	1,135	"	"
1923	1,124	"	"
1924	494	"	"
1925	595	"	"

Beginning with 1927 it is obligatory that rates be made to correspond with expenses and interest charges against the railways. Indeed, thanks to the economies realized, thanks to the increases in rates and the volume of traffic, the French railways have realized this equilibrium a year earlier than the time when this equilibrium was to have become obligatory.

It is worth while noting that the equilibrium obtained in 1926 would have been obtained since 1922 had it not been for the 8-hour day which brings an annual charge of about 1,300,000,000 francs, of which 1,000,000,000 is in wages.

Reforms in the Ministry of Public Works

In conformance with the program of simplification and administrative reorganization undertaken by the government, Minister of Public Works Tardieu has worked out a plan of economy and reform in his department. We have pointed out above measures undertaken under this program which concerns the construction of new lines. We have also indicated that on their own initiative the railways have slowed down or suspended completion of their electrification program. Other measures have been taken or prepared by the government.

The suburban services are operated at a loss by the railways and the deficit reached 240,000,000 francs in 1925 in spite of the increase in rates. This paradoxical situation has long been denounced and the setting up of a special organization to operate these lines is mooted. M. Tardieu has entered into negotiations with the city of Paris, the department of the Seine and the suburban communities in the hope of solving this problem. In addition, he has proposed a series of measures destined to simplify administrative procedure and to hasten the conduct of business—both by a reduction in "red tape" and by a decentralization of authority.

The Financial and Accounting Reorganization of the State Railway

The agreement of June 28, 1921, placed the State Railway and the private lines on the same basis. Both were required to conform in matters concerning common interest to the decisions rendered by a majority vote of the direction committee of the large railways. As a matter of fact the situation of the State Railway remains somewhat different from that of the companies. Its budgets were submitted to Parliament. Its acounting methods resembled more public accounting than that of commercial concerns. It was the Minister of Finance who was charged with placing the loans for these lines. A decree bearing the date of November 16 and effective January 1, 1927, has put an end in part to this situation. The State Railway is henceforth to enjoy financial autonomy. The receipts and disbursements of these lines will no longer be attached as an annex to the general budget and voted by Parliament. The railway budget will in future be approved simply by decree on presentation of the Minister of Public Works and the Minister of Finance.

The supplementary credits recognized during the course of the year will be made public on the same form as the total of the original credits. Parliament reserves, nevertheless, the right of overseeing the operation of the line. The annual statements must be submitted to it.

As far as accounting is concerned the administration of the State Railway will work out its receipts and expenditures and keep its statements in the commercial form in use on the private railways.

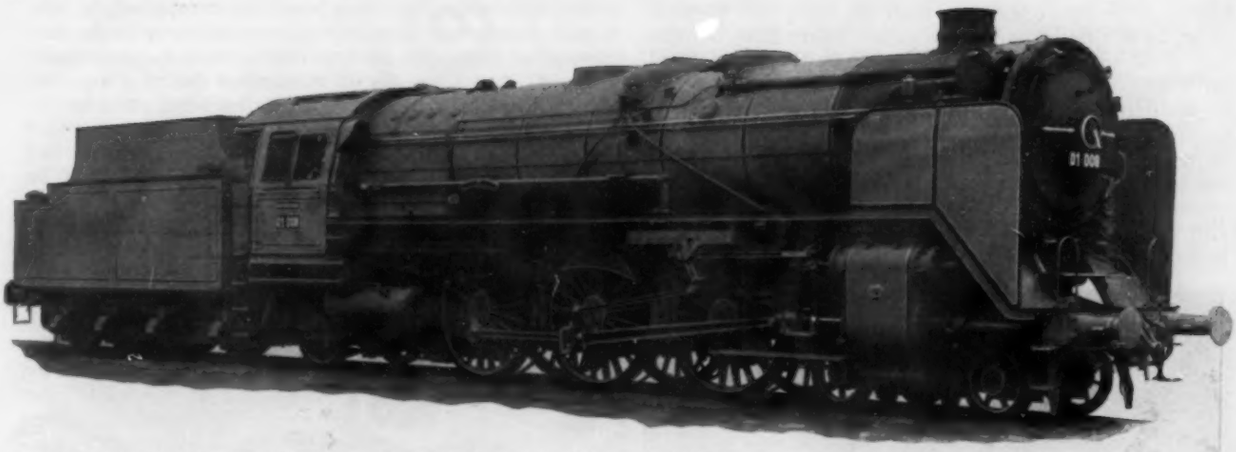
As a counterpart to the financial autonomy conceded to this line and "to affirm its character as a State Railway," the new decree strengthens government control over its operations by: 1. creating, in connection with a directing committee instituted by a decree of June 8, 1922, a government commissariat; 2. instituting commissioners of accounts from among the employees of the Financial Inspection and members of the "Cour des Comptes."

A Dam for Hydro-electric Power

Changes in Alsace-Lorraine Management

The administration hopes that the measures adopted will permit a saving of 2,000,000 francs during the next year and about 10,000,000 francs a year a few years hence, coming from the dismissal of surplus employees. Another decree is expected which will regulate in the same fashion the question of the financial autonomy of the Alsace-Lorraine railway.

In conclusion, if from a technical standpoint the situation of the French railways is being constantly improved, the financial future, althought obscure, during the past year has clarified itself. But financial equilibrium remains fragile, being subordinated as it is to the monetary and economic situation of the country, which is still uncertain.



Standard 2-Cylinder Superheated Heavy Passenger Locomotive of the German State Railway

German Railways Doing Well

Fulfilling Dawes plan obligations and improving efficiency of operation—Full success dependent upon economic conditions

By Dr. Alwin Sperber

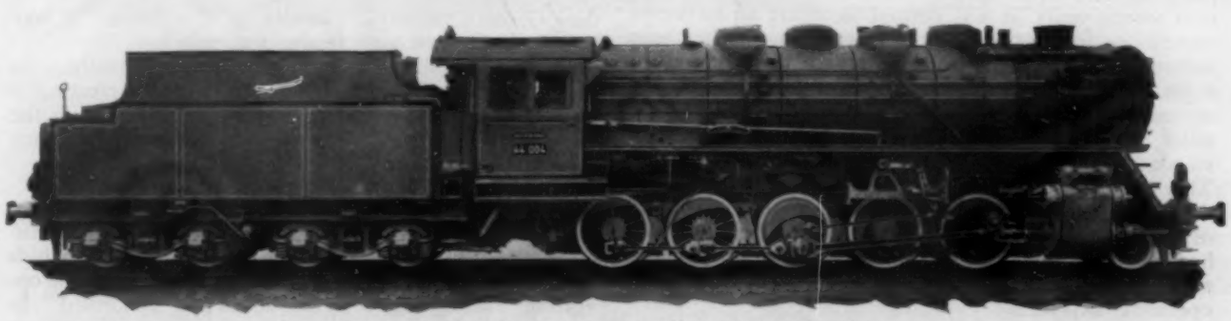
THE year 1926 is the second one in which the railroads of Germany under the management of the Deutsche Reichsbahn-Gesellschaft (the German State Railway Company), helped carry out the Dawes plan. The first fiscal year of the company required the installation of numerous innovations, in order to handle the work more economically, and to attain a greater income. The second fiscal year has been devoted to the systematic continuation of these steps, which were to place the State Railway Company in the position to fulfil its duty of chief contributor to the reparations payments, and, at the same time, to manage the property in such a way as to serve the interests of German economic life. In the way of actual new developments, there is less to say now than there was a year ago.

Period Covered

The period covered by the latest report of the railway company comprised the last two-thirds of the second, and the first third of the third reparations year, which runs, according to the Dawes plan, from September 1 to August 31. In this year the 660 millions gold marks to be paid annually did not have to be paid in full, but were kept, under the law, in reserve for the purpose of interest payments and the discharge of the reparations bonds issued. A total of 580 million gold marks had to be secured for the reparations bonds, and in addition 40.4 million gold marks as dividends on the preferred shares; and about 87 millions as reserve fund which have to be collected, in conformity with the law, until an amount of 500 millions has been reached, which amount has to be derived from 2 per cent of the yearly income. This makes a total of some 707 million marks. Furthermore, over 250 millions had to be paid out as a transportation tax which is not included in the figures of the State Railway Company, but which is yet of importance since it has to be secured through an increase in railway rates.

Earns Reparations Requirements

The State Railway Company will earn these amounts in the course of the current business year, although its



Three-Cylinder Standard Decapod for Freight Service

task is even more difficult than in the previous year. Now, as before, labor is very high. There have been no important increases in wages; still, on the other hand, no economies of any consequence could be made by decreasing forces, since all that could be made in this respect has already been done. Only in the shops some reduction in forces was possible, but this was not much felt in view of the fact that there are 700,000 wage earners on the railways. All the sums which the company has still to pay in the way of pensions and unemployment benefits to such employees constitute a heavy burden to

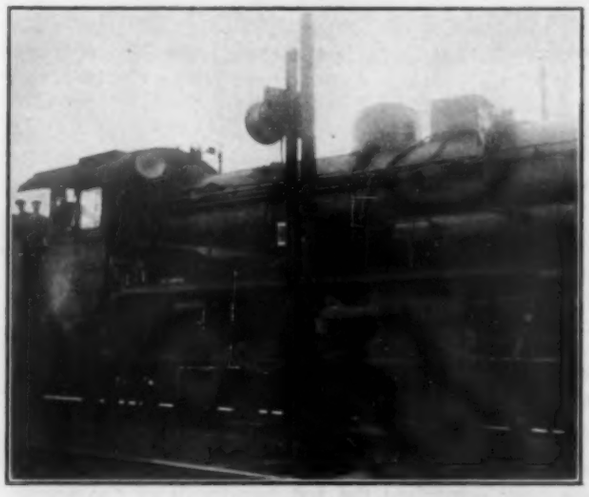
The Indicator in the Cab

carry. This political burden resting on the shoulders of the State Railway, the care of the employees who under normal economic conditions would never have been employed, has remained practically unchanged.

Higher Rates Impossible

Considerable expense also has been incurred in maintenance-of-way and structures. Considering that during and since the war up to the period of the stabilization of the German mark, maintenance lagged greatly, the company was forced to spread out these arrears gradually over several years. It was desired to secure an increased capacity to insure the safety of operations. It has been contemplated to relay 1,925 miles of line, this being about 4 per cent of the main through tracks of the trunk and secondary lines; actually in the course of 1926, 2,360 miles were relaid. The company has undertaken to standardize its roadbed for both wood and steel ties. This standard is designed to meet the ever increasing demands of heavier traffic; it is more costly than those of the various German states, each of which formerly had its own standards. Maintenance-of-way expenses totaled 245 million Reichsmarks, 6.43 per cent of total operating expenses.

The greatest difficulty encountered in carrying out the reparations obligations has been the unsatisfactory economic situation in Germany. The crisis came in the first months of 1926, manifesting itself by such a considerable decrease in the volume of traffic that the total revenue remained far behind the normally expected returns for these months, and accordingly the railway was compelled to call upon a balance of about 153 million marks carried forward from the previous year. About 100 million marks of this balance were made use of in the first half of the year. Under these conditions the question arose as to whether the decrease in returns could be offset by an increase in freight rates. But an increase in the rates could not be contemplated, in view of the fact that they were already very high, and it was possible that they already had a depressing influence on business. For that reason increases could hardly bring about the increased revenue desired. Rather, possibly, the freight rates might be lowered, in order to promote increased revenue by bringing more traffic. However, a thorough examination of conditions showed that a general decrease in freight schedules would not bring about the results desired, since it alone could not contribute to influence economic conditions favorably, these being unfavorable owing to other factors which could only be gradually worked out in the future. In some instances, however, special tariffs were granted to certain economic territories in which high rates had an obvious influence on the unsatisfactory condition of some industry, and indeed, through the lowering of rates in this particular field increases in the volume of business resulted. In addition to this, other low rates were made because of the unstable exchange of certain neighboring countries where there was danger that freight might be carried by other



The Fog Horn Alongside the Track Which Actuates the Mechanism in the Cab

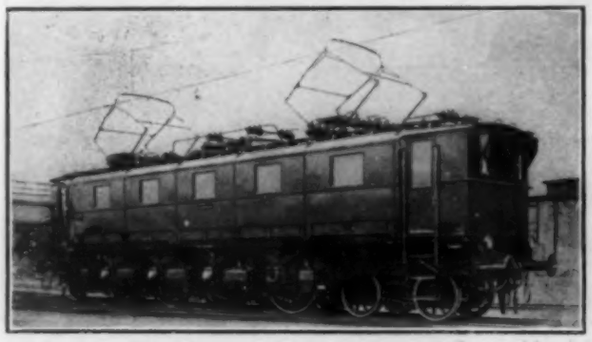
than German railways; likewise by this method it was hoped to win back some business already lost.

Improved economic conditions came gradually. In May the miners' strike started in England, creating a noticeable activity in the transportation of coal over the German railways and this traffic helped to ease conditions during the second half of the year.

Stringent Economy Necessary

It is unnecessary to point out that this economic situation helped to carry out with energy the measures which were contemplated to increase the effectiveness of the operation. Improvement in the shops was continued. In order to further general economy in the management at

the beginning of the year a special accounting system was set up under which the various railway district managements were considered as independent business units which had to balance up all income and expenditures of their own particular districts, and to settle with the other managements. The added economy which



Electric Locomotive for Express Passenger Service

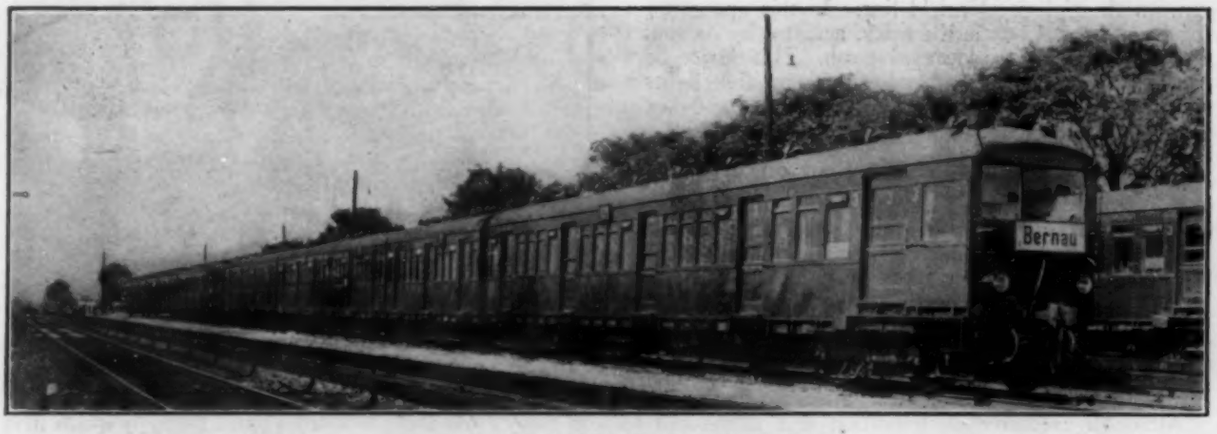
arose thereby in each district turned out to the advantage of the entire enterprise.

Bridge Improvement Progresses

Through these repeated efforts greater efficiency was acquired, but it had to be accompanied by the greatest economy in improvements, or in carrying on railway work already started as well as in the purchase of rolling stock, technical improvements, and in the introduction of innovations. However, the financial situation never brought a standstill in the activities named above. Also, in the course of this year, the reconstruction and reinforcement of bridges was continued everywhere, in order to cope with the ever-increasing load of the traffic to be carried. The reinforcement and changes of bridges in the year 1926 was limited to those which were overtaxed. This work was energetically pushed through. Among others which were finished, we may mention the new bridges across the Oder and the Warthe near Kustrin, and also the large bridge across the Elbe, near Meissen and Stendal, so that, before long heavy freight trains and the heaviest locomotives will be able to run from the Ruhr territory to Berlin. In numerous constructions "St. 48" high grade structural steel was used, this steel coming fully up to expectations. The railways in order to combine technical improvements with an increase in economy showed a marked interest in a still higher grade steel, the "Freud" steel (Silicium steel). They encouraged the preliminary work in introducing this steel with which they are before long going to build two railway bridges. While with the "St. 48" steel, as compared with common ingot iron a 30 per cent higher tension can be secured, wherefrom a saving in weight of from 15 to 20 per cent can be attained, the new steel can stand 50 per cent more strain than common ingot iron, thereby granting an additional saving in weight.

The numerous changes to be made in the bridges often placed the railways face to face with some difficult problems. Special interest is attached to the modification of a four-track viaduct pasing over a street railway between Hamburg and Altoona, over which pass daily 400 trains from the suburbs and 200 trains from the main line. This change had to be made while the full schedule of operation of both the railroad and street traffic was being maintained.

Renewing Under Traffic a Four-Track Bridge Over a Street



An Electric Rapid Transit Train in Berlin

Mechanical Department Progress

In the mechanical department as compared with the activity of the previous year, there is very little new to report. The first standardized locomotives built according to the exchange building agreement have now been placed in service, as well as a few storage battery cars on which some improvements have been made and some

motor cars provided with internal combustion engines. In addition to these for the handling of light traffic some small locomotives have also been built. Whether for the handling of this traffic the small locomotives or the motor cars are to be preferred must be learned through experience. The customary plunger buffers at the ends of cars, with which all the rolling stock has been equipped up to now, but which have not met the requirements of increasing traffic, are being replaced by hollow cylindrical buffers capable of standing the strain much better. Through this the heavy rising repair cost of the buffers has been lowered. Moreover the new buffers prevent, when cars come together, the slight creeping up, which could be frequently observed in the case of plunger buffers, which latter moreover bent more easily as soon as the buffer stops were out of alignment.

Freight Train Leaving Hirschberg, Germany

The effort to improve the safety of operation led to extensive tests in the field of automatic train control. The devices which were tested here are already used in America. In order to meet local conditions novel experiments were undertaken with a new automatic train control apparatus, the "Nautophon," manufactured by the Signal-Gesellschaft at Kiel, which was tested at Dormagen, on the Cologne-Krefeld line. In this apparatus a fog horn, located beside the track, actuates by its sound a device located in the locomotive cab. This device electrically operates the brakes, and at the same time lights a signal in the cab.

Electrification Found to Pay 12 Per Cent on Investment

Progress was made in electrification. Among other electrified lines placed in operation, the extension on the Munich-Landhut trunk line deserves first mention. By the end of 1926 there were 651 miles of electrified line on the State Railway system with about 300 electric locomotives, and 350 motor cars.

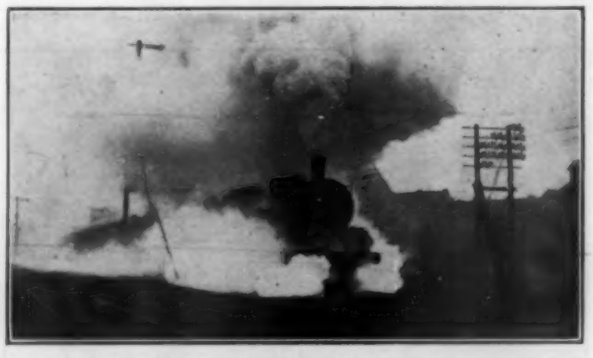
Included in the present electrification program are various trunk lines, as well as the entire Berlin city and belt lines, connecting the suburbs, a total mileage of 240.

Although extensive electrification was introduced to an important extent but a few years back on the trunk lines of the German State Railway Company, it can already be stated that, on heavy traffic lines the results have caused one to ponder over operation by steam. Electric operation has been found to yield on the average about 12 per cent on the capital invested. Although electric train operation has hardly passed the experimental stage in Germany, it has already succeeded in making good with but a few types of electric locomotives which are suited to the profile of the main lines, while with steam operation, to satisfy the requirements of traffic, a larger number of locomotive types is required. In this respect the company has placed orders for various types of experimental high speed and heavy duty electric locomotives. An accompanying illustration shows one of these which is capable of hauling the heaviest express trains at a speed of 68 miles per hour.

The improvement of traffic conditions on the city belt and suburban railway of Berlin has progressed steadily owing to the increase of electric operation during the year. On such of the city railway lines which have been electrified, the current of 800 volts is carried by an underrunning third rail, protected from contact on top and at the side. The train unit for the city railway trains is made up of a motor car and a trailer. This trailer has on the end away from the motor car a motorman's cab. Trains are made up of one, two, three or four of these two-car units.

Facilitate Traffic

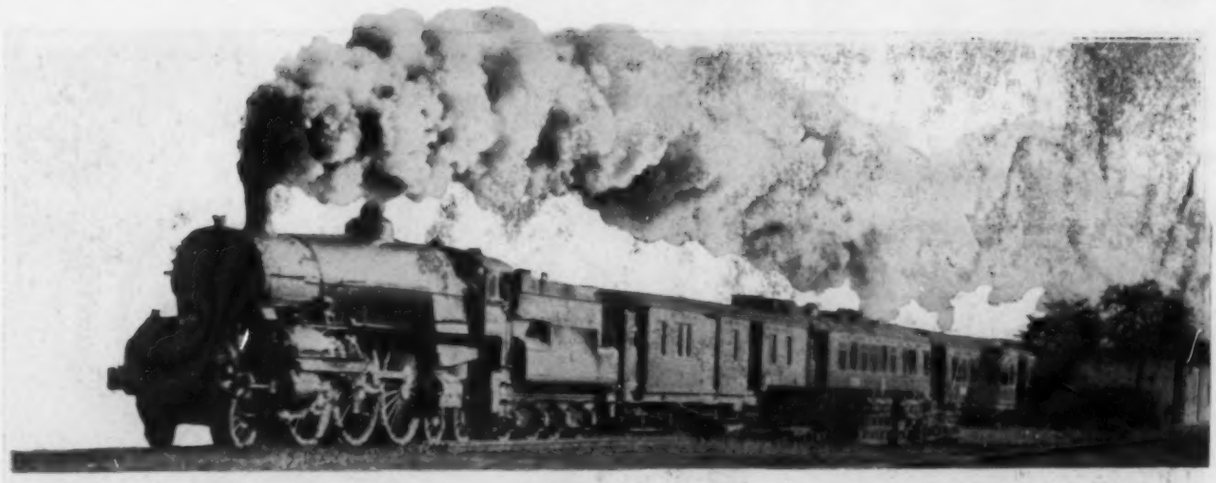
The heavy burdens which the company has had to face have not prevented it from devoting its attention to steps which would tend to facilitate traffic. In this connection particular mention should be made of the adoption of



Warsaw Express Leaving Hanover, Germany

train telephony, which is available on all the through trains on the Berlin-Hamburg line. In a compartment on every train there is a radio outfit through which it is possible to carry on while the train is in motion telephonic conversation with any telephone subscriber in the country. Antennæ on the roofs of the cars induce currents in the telegraph lines along the tracks. The telegraph lines connect with special long distance stations for radio train telephony, which are located about 500 miles apart. Extension of the service to the Berlin-Munich line is being planned.

Thus, with the end of the year the German Railway Company gives proof of its continued efforts to meet all requirements made of it. Whether it will succeed in continuing doing so will chiefly depend on economic developments in Germany.



The Arlberg Express, the Fastest Austrian International Train, in Full Speed Near Vienna

Austrian Railways Progress Slowly

Deficit reduced but still not wiped out—Highway competition severe—Electrification continues

By A. Niklitschek

AS is generally known, Austria suffers under considerable natural disadvantages from a railway standpoint. More than half of the total railway mileage (3,675 miles) is in mountainous districts. This makes for high operating expenses—maintenance-of-way and fuel consumption as well as the necessity of employing many brakemen on the freight trains, since air brakes are not in use. Bulky traffic such as ore and coal is scarce. Wood is the principal rough commodity. Passenger traffic, on the other hand, is considerable, particularly during the tourist season when many passengers are attracted to the railways because of the great natural beauty of the country served.

Deficit Not Yet Disappeared

Right after the war the Austrian railways were managed by the state in such a disorganized and uneconomical manner that the operating deficit grew to be more than half of the total government budget. In 1923 the railways were radically reorganized under the advice of the well-known English railway expert, the late Sir William Acworth. The first thing done was to withdraw the railways from direct governmental influence and to place them upon a strict commercial basis. The results have been splendid. The deficit has been reduced to a very low figure. To be sure it has not yet vanished entirely, but this is more the fault of the still unsound economic conditions in Central Europe than it is the railways.

In the few years since the reorganization took place everything has been done to bring the railways to a high state of technical efficiency, and at present they may be ranked among the best in Europe. Speed of trains is much higher than ever in history. The accident record compares favorably on a train-mile basis with France and Germany and may be attributed to standard safety practices and improved signaling.

The electrification of the railways is a very important

A Local Train Leaving South Station, Vienna

Near West Station, Vienna

An Express Train Near Neulengbach, Austria

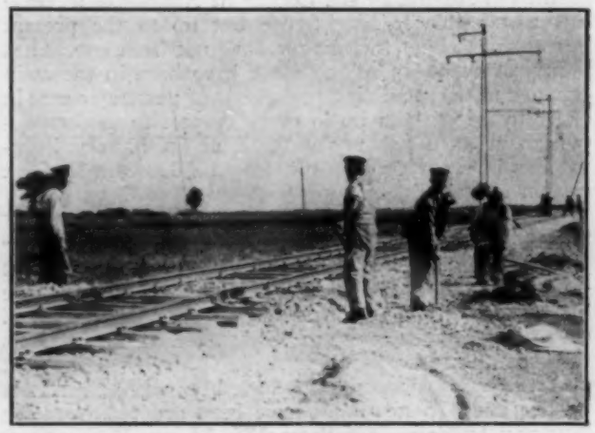
economic problem for Austria, since the country has for locomotive fuel only inferior brown coals and lignite and therefore must import coal for railway purposes from foreign countries. On the other hand potential water power resources are extraordinarily large.

Under the immediate program it is intended to electrify 390 miles of line. The principal line to be electrified is Innsbruck-Landeck-Bludenz-Feldkirch line, as well as those leading to the Austrian lakes. The Steinach-Irdning-Attnang-Puchheim line has been in process of electrification since 1923. At present about 166 miles are being operated electrically. The electric power is single-phase alternating current at 15,000 volts and 16⅔ cycles. For the supply of energy there are the following four power stations, these being property of the railways: Spullersee, Ruetz, Stubch and Mallnitz. These plants supply at present about 80,000 h.p. and can be raised up to about 144,000 h.p. Work is progressing well on the electrification program and during 1927 a considerable amount of extension can be expected.

With the completion of the total electrification program the Austrian Federal Railways will have four electrified lines reaching frontier stations. At the end of the year 1929 an important Central European international main line, Salzburg-Innsbruck-Zürich-Genoa, about 500 miles (traversing Austria, Switzerland and Italy), will be electrified throughout with the same current.

At present seven locomotives for mountain service, 20 passenger locomotives, 20 freight locomotives and four storage battery locomotives are in service. Under order are 24 express passenger locomotives, 27 freight locomotives, three switching locomotives and 10 locomotives for different service.

The Vienna City Railway was electrified in 1925.



An Austrian Section Gang at Work

This railway was built between 1900 and 1914 for steam operation. From 1914 until 1924 it was out of service, inasmuch as with nearly half of its lines subway and elevated steam operation was not successful. The city of Vienna accordingly electrified the line.

A Double-Header Express Passenger Train on a Four-Track Line in Austria

Improvements

One great handicap of the Austrian Federal Railways is the light axle-loading permitted by its structures. On

the Vienna-Salzburg line the maximum is 16 tons and on the other lines only 14½ tons. The directorate of the railways is considering the use of a part of the money granted to Austria by the League of Nations to increase this permissible loading figure but up to the present negotiations about this matter have not been concluded.

Improvements in rolling stock have been in the main confined to the rebuilding and repair of passenger cars in order to bring them up in every respect to modern requirements of upholstery and interior finish. Gas lighting has been replaced on more than 2,000 cars by Dick system electric lights.

Freight Car Innovation

In the building of freight cars there has been slight innovation. As with nearly all European railways, the little 10 to 15-ton car with two axles is predominant and cars of 30 tons or over are very scarce. Improvements in locomotives are more marked. More than 200 old and uneconomical locomotives have been withdrawn from service and 175 new ones have been ordered from the Austrian builders. Of these 175, 25 are Pacific type, 100 Mikado and 50 switching. All will be equipped with the Lentz poppet valve gear and the Dabeg feedwater system. Fifty-six locomotives will be fitted with Westinghouse brakes. For the passenger locomotives the Hardy vacuum brake will be used. It is not planned to use continuous brakes generally in freight service. The Austrian Federal Railways had at the end of 1925 the following equipment:

3,100 locomotives	0.85 per mile
6,150 passenger cars	1.67 per mile
360,000 freight cars	9.8 per mile

During the year 1924 services of watchmen were dispensed with at more than 600 highway crossings and their places taken by signals.

An Electric Local Train in Austria

Competition by Automotive Vehicles and Airplanes

The Austrian Federal Railways had for the first half of 1926 a deficit of 26,000,000 Austrian shillings ($3,700,000) this figure being 1,800,000 A.s. more than the budget estimated. This deficit was surprising, although the railways are always relatively inactive during the first half of the year on account of the decline in tourist travel and the shipment of wood, which both are at their greatest in summer.

Offsetting an increase of 30 per cent raise in passenger tariffs on January 1, 1926, the deficit has accrued from the continually growing competition by the automobiles and airplanes. The latter especially flourish in passenger service because their rates are but slightly higher than those of first-class railway express train service and the saving in time is considerable, the railway lines being mostly in the mountains, where high speeds are impossible. The scheduled speed of express trains is about 40 m.p.h. and of ordinary passenger trains about 20 m.p.h. In Austria there are many little local trains with poor traffic. They are mostly in the high mountain districts and the operating and maintenance costs are very high; therefore, they earn no profit. Such lines cannot stand bus competition. The buses are cheaper and quicker, therefore preferred by travelers.

An Unprotected Grade Crossing in Austria

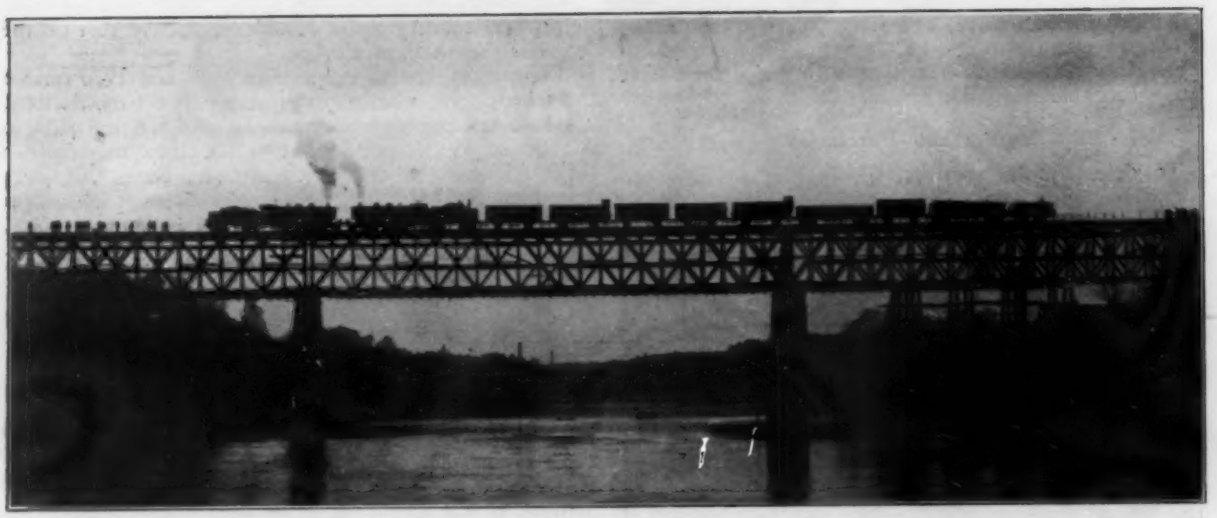
Motor Truck Preferred

Although the railways have special low tariffs for package freight up to distances of 100 kilometers (62 miles) the motor truck is nevertheless being preferred. The railways have lost thereby as much as 81 per cent of the business at some stations, which means a considerable loss for the railways as a whole. Just at present there is an investigation under way which aims to arrive at definite conclusions as to what should be done in this connection. A questionnaire sent out in advance of the meeting on this subject contains the following questions:

1. Should the present competition between railways and motor vehicles be curtailed by law or should the outcome be left to natural development?

2. Can the motor vehicle entirely replace a railway line, permitting uneconomical lines to be abandoned?

3. Is the competition between the motor vehicles and railways on a basis of equality or is there a disparity in that the railways build their own lines, while the motor vehicles make use of the highways which are built and maintained from the public taxes? In what way could the competition between motor vehicles and railways be equalized? Perhaps by special taxation?



Bridge over Niemen River, Polish Railways

Polish Railways Doing Well

Freight traffic shows tremendous increase—Future growth depends on international factors

By W. de Wankowicz

SINCE the reconstruction of the Polish State Railways, involving lines of greater significance from the transportation viewpoint—half of the destroyed bridges having been rebuilt (both in number and length), as well as 86 per cent of stations, 50 per cent of all pertinent buildings, etc.—the railways have

Locomotive Works at Chrzanow

devoted themselves to improving their lines. Tracks and structures have been strengthened, additional tracks laid and new buildings erected. In the last mentioned category may be included the reconstruction of the Warsaw terminal, planned on a great scale, and more than partially completed; also work now under way within the confines of the ports of Gdynia and Gdansk.

In addition, a number of stations were erected along the borders, especially on the Western portion. Permanent bridges were constructed in place of the wooden bridges erected during the war, among these the large bridge over the San river. Work was also begun on a bridge over the Vistula at Sandomierz. For the purpose of supplementing the system, approximately 245 miles of new line have been laid.

At present there are under construction 310 miles of new standard gage government lines, among which is the Kalety-Podzamcze line, 70 miles long. This will be an important line, since it will shorten the distance between the coal mines and the rail lines in the northwest, as well as the Baltic Sea; secondly, it will relieve other lines whose capacity is about exhausted.

Construction is planned for the near future of three new government lines of an aggregate length of over 180 miles; private interests plan to build 800 miles of track to be located almost entirely within the former Congress Poland, where the system is weakest.

The most important of these have been undertaken by the T. R. I. Company, participated in by the French firms; Société Générale des Entreprises, and Schneider & Co., which together contemplate construction of five lines of a total length of 578 miles. Concessions for these private railways have already been granted, and work on the respective projects is now in progress. Their ultimate fate, however, depends on the financing of their construction, in which connection negotiations are now pending between the T. R. I. Company and American capitalists. The interest of the English firm, Sir W. G. Armstrong, Whitworth & Co., is also sought by some of the concessioners.

The railways have been forced to take steps in the direction of replenishing and modernizing their rolling stock. Initial efforts in the attainment of this end, in-

volving both locomotives and freight cars, were met by American manufacturers. However, as domestic locomotive and car plants began to spring up, they have lately been receiving the orders.

Equipment Purchases

To date, 842 locomotives, 683 passenger cars and 1,090 freight cars have been purchased. There remain to be purchased, according to this year's estimate, 37 locomotives, 46 passenger cars and 1,710 freight cars. Next year the railways intend to purchase 100 locomotives, 70 passenger and 2,700 freight cars. At present, i.e., at the end of the year 1926, the railways own 5,216 locomotives, 10,047 passenger cars and 138,903 freight cars. To keep this equipment in condition two new shops are being built and are well under way; work on a third has been started. Special attention has been devoted to increasing locomotive mileage, and since 1923 much progress has been made in this direction, especially in freight service. Great progress also has been made in fuel conservation.

A Suburban Station Near Warsaw

Traffic Grows Rapidly

Traffic is growing. Whereas, in 1919 and 1920 passenger traffic was practically twice as great as freight, statistics for 1925 disclose a diametrically opposite situation, showing a steady rise in freight traffic to the fullest capacity of the railways.

The rise in freight traffic is constant and more and more approximates that of pre-war days. The attainment and possible surpassing of the pre-war volume is only partly dependent upon business conditions in Poland, mainly it depends on future transportation relations with foreign countries, principally with Russia, when that country again resumes an active role on the economic markets of Europe.

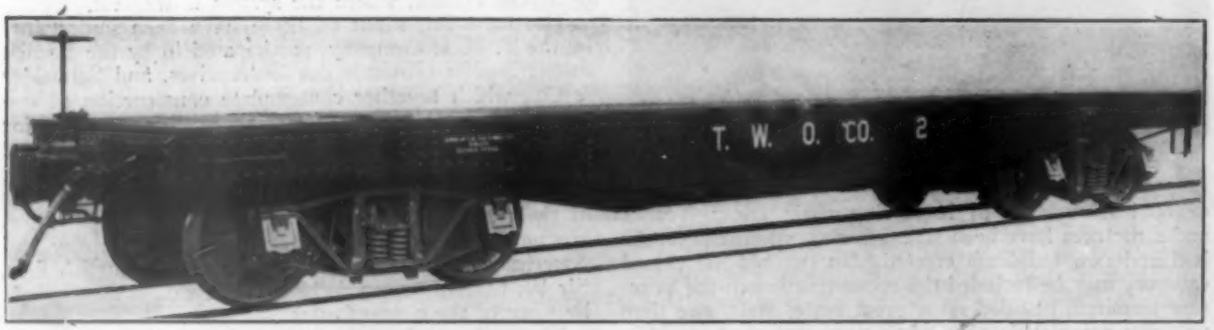
Freight per freight-car axle in 1919 and 1920 totaled 3.3 metric tons, whereas at present it is 6.4 metric tons. Carloadings per day mounted from 4,178 in 1920 to 10,400 in 1925. In August, 1926, they mounted to 14,000 and in September to 20,000. Rates originally based on the needs of the railways as they existed in 1921, underwent many changes before the year 1924, i.e., at the time of stabilization of currency in Poland. Even at the present, they cannot be regarded as the last word in railroad tariff policy from the viewpoint of transportation enterprise, for their fixing was influenced by factors closely connected with the country's economic policy, directed to the attainment of a favorable trade balance.

The Polish Railways have already effected several transportation agreements with foreign countries and have arranged to put into execution international tariffs in their communication with adjacent, as well as more remote, railways.

The financial results of the operation of the railways has been favorable since 1924 in contradistinction to prior years when inflation caused a constant deficit in the railroad balance. The year 1924 brought an excess of revenues in the amount of 71,550,000 zlotys,* and the year 1925 only 1,880,000, which drop is explained by the fact that in the latter period, the cost of new rolling stock was deducted from revenues, whereas in 1924 this cost was accounted for in the investments column. The first half of 1926 shows excess of income over disbursements to the amount of 38,921,000 zlotys.

Passenger Station, Lemberg

*The zloty is worth approximately 12 cents at current exchange rates.



40-Ton Capacity Flat Car Built for the Tide Water Oil Company by the American Car & Foundry Company—Length Over End Sills, 36 ft.

Ewing Galloway

Railways Progress in Russia

Physical conditions improve and traffic increases—Railways beginning to build own equipment

By Harold Kellock
Statistical Director, Russian Information Bureau

THE restoration of the railways in the Soviet Union has been a gradual but steady progress. Both trackage and equipment suffered heavily in both the World War and the period of civil strife. Some 13,200 miles of track were completely destroyed and also 7,762 railway bridges. By the end of 1919 there were hardly 4,000 good order locomotives in the entire country of 8,200,000 square miles. A large proportion of the mileage, with proportionate equipment, had passed to the border countries which were severed from the territory of the former Russian Empire at the close of the war.

The most urgent economic task confronting the country at that time was the restoration of the railways to a working basis. Until this was effected there could obviously be no substantial economic progress, for the recovery of industry depended on the recovery of the railways. Radical methods had to be adopted to repair the tremendous destruction of basic capital in the transport system. Accordingly the state gold reserve was drawn upon heavily to purchase the necessary equipment abroad, and one of the best administrators developed in Russia since the downfall of the Tsarist regime, Djerzinsky, was placed in command of the transport system, at the head of the Commissariat for transport. He remained at that post until the roads were restored to a sound working basis.

From any occidental standpoint Tsarist Russia had always been a backward country in regard to transport. In 1913, the total railway mileage was 42,500 miles. With a land area nearly three times that of the United States, the railway mileage was about a sixth that of the United States. The principal lines were built and operated by the government. It was only during the decade before the war that private capital was called into the transport system. At the opening of the war about 10 per cent of the mileage was under private operation in partnership with the government.

Pre-War Standards Not Entirely Restored

Today the mileage (46,157 miles) is greater than pre-war, despite the losses to the border countries where the Tsarist government had built a network of strategic railways for the anticipated war with Germany. The volume of traffic is about 80 per cent of pre-war, the population being about 77 per cent of that of 1913. The number of good order locomotives in August was 10,818, as compared with 16,850 in 1913. Average daily freight car loadings in September last were 28,531, as compared with an average of 24,007 for the Soviet fiscal year 1925-26 (ending September 30, 1926), 17,401 for 1924-25, 13,517 for 1923-24, 11,744 for 1922-23, and 33,000 in 1913. In general equipment and rolling stock has not yet been brought up to the pre-war standard, but the gain in the past five years has been notable and steady. During 1924-25 the railway system showed a net profit from operation of $5,655,000, the first profitable year since the war. The full report for the past fiscal year has not yet reached this country. The total revenues for 1925-26, according to preliminary figures, were $659,200,000, as compared with $478,332,000 the previous year. This coincides generally with the increase in industrial production for the year, which was 41 per cent. The increase in agricultural production was nearly 40 per cent, the year 1924 having yielded a poor harvest.

Most New Construction in Siberia

Extensions to existing lines are steadily being pushed. Among the new lines being built is the South Siberian trunk line, from Orsk to Barnaul, 1,250 miles. During the present fiscal year work will be begun on four other new lines, and four others, already under construction, will be completed or pushed towards completion. The new lines are for the most part in hitherto undeveloped provincial districts, most of them in Siberia, where development of rich natural resources is being undertaken. The most important of the new lines to be begun this

year (work will start in a few weeks) is a railway to run from Semipolatinsk, in southwestern Siberia, almost directly south to Frunze (formerly Pishpek) in the cotton belt in Central Asia, 882 miles. This line will bring both Siberian grain and timber, from regions rich in both, to the Turkestan cotton districts where both are scarce, and it will cut across some of the richest undeveloped coal districts in the Soviet Union. In 1925 Central Asia had a deficit of about 340,000 tons of grain while the Siberian peasants harvested a 400,000-ton surplus which they were unable to sell.

The plan for the current fiscal year for the entire Soviet Union calls for new construction aggregating 1,400 miles of railway line.

A beginning has already been made in electrifying the suburban lines about Moscow and Leningrad, and an extensive program is projected for the next five years.

Traffic Heavy

While the railway rolling stock is not yet up to pre-war standards, it may be said that a more efficient use is being made of the equipment as it exists. This is indicated by the following figures on passenger and freight traffic, the data for 1925-26 being preliminary:

	1913	1924-25	1925-26
Passenger traffic Million passenger-kilometers	25,220	19,040	25,600
Freight traffic Million ton-kilometers	65,670	47,414	67,580

Locomotives and Cars Being Built in Russia

During the past fiscal year the importation of considerable quantities of rolling stock from abroad virtually ceased. New locomotives, 118 in number, built in Soviet plants, were added to the system, along with 820 freight cars and 299 passenger cars. This year it is planned to build 350 new locomotives and mass production of freight cars is being organized. During the past year upwards of 1,500 old locomotives carried on the roster for several years were cut up for junk.

The increase in good order locomotives and cars is shown in the following tables:

	Average daily locomotives	Percentage good order
October, 1924	20,277	45.3
August, 1925	20,235	49.6
August, 1926	18,749	57.6

	Average daily freight and passenger cars	
October, 1924	441,800	71.6
June, 1925	448,700	75.1
June, 1926	454,100	85.4

Freight handled, in millions of ton-kilometers, in representative months was as follows:

October, 1924	3,609
June, 1925	3,805
June, 1926	5,451

"Hard-Seat" and "Soft-Seat" Passenger Service

Passenger service, in respect to speed of trains, comfort, etc., is now restored to the pre-war standard. There are but two classes of passenger service now, instead of the former three. There are now "hard-seat" cars and "soft-seat" cars, and the price for a seat in the latter is double that of the former. Trains are divided into three classes: local, "accelerated," and express, the last-named scheduled to travel at a rate of from 50 to 60 kilometers per hour. Excess fare of 25 per cent is charged on express trains. In general it may be said that, while passenger charges are about the same as pre-war, freight charges are about 20 per cent lower. The Soviet Union is an inexpensive country for railway travel.

Under Djerzinsky, who was a relentless organizer, time tables took on a thoroughly occidental significance. Recent travelers have found that trains stick to their schedules, and this applies to service in remote places. Between Leningrad and Moscow, 405 miles, an overnight express service of 14½ hours is maintained. This is not record-breaking, according to American standards, but it is excellent time for Eastern Europe, and the trains usually pull in according to schedule. The Trans-Siberian Railway has re-established the pre-war time table between Moscow and the Far East.

Airplanes Supplement Rail Service

A post-war development of great importance in the Soviet Union has been the rapid rise of airplane lines supplementing the railways and connecting strategic economic points. At present there are over 10,000 miles of airplane lines in regular operation, carrying passengers, mail and some freight. Most of the principal cities of European Russia are linked together by these lines, and several of them connect the Trans-Siberian Railway with remote districts, in some cases giving a connection in a few hours with points that formerly required several weeks of uncertain and laborious travel under primitive conditions of transport. From the frozen northern stretches of Siberia valuable furs are now transported by airplane south to the railway line, the boom sections along the Lena and the Aldan gold fields get mail from civilization days ahead of the former schedule, by planes that cut across hundreds of miles from Lake Baikal, and through the air service the time for reaching remote places in Central Asia has been reduced to a figure that the good folk in the cotton provinces can scarcely believe, though they see the planes flash past the camel trains plodding over the desert.

Railways Operated Directly by Government

The railways are operated directly by the government under the Commissariat for Transport. The transport system, along with the posts, telegraph and telephone systems are the only industrial enterprises operated directly by departments of the government. Such public services were also operated by the government before the revolution, so in this respect there has been no change in principle. Yet it is fair to state that, in respect to the character of railway development, there has been a material change. In the years before 1914 the Tsarist government was so engrossed in perfecting its system of strategic military railways in the Western portion of its territory that extensions demanded for economic development in the back country were neglected. Germany, bristling with armament and fulminating of "a place in the sun," crowded the western boundary, and Tsarist Russia, linked to France with golden chains, expected to secure the Bosphorus as a result of the anticipated world conflict. Both Kaiser and Tsar faded out as a result of the titanic struggle, and today the Soviet Union is extending its railway system according to a plan designed primarily to develop the vast natural resources of the country. The government extensions are being supplemented here and there by lines built by some of the larger concessionaries, though as yet this process has not become of great significance.

In general it may be said that the railway system of the Soviet Union has now made up for the widespread destruction caused by the World War and the prolonged internal conflicts. An era of railway progress along carefully planned economic lines is under way. In the matter of railway development the country is about half a century behind the United States. Its tremendous natural resources predicate a notable development of transportation during the next few decades. For this lack of basic capital within the country is the greatest present handicap. The economic possibilities of the country are so vast that it is safe to predict that this handicap will be overcome.

NEWS *of the* WEEK

THE INTERSTATE COMMERCE COMMISSION has issued a tentative valuation report on the Atlantic Coast Line finding the final value for rate making purposes to be $154,359,373 for carrier property used as of 1917.

THE PACIFIC RAILWAY CLUB is to hold its next meeting at the Palace Hotel, San Francisco, on Tuesday evening, January 4. The speaker will be Donald D. Conn, A. R. A., who will speak on the railroads' relation to the agricultural problem.

THE BROTHERHOOD OF LOCOMOTIVE ENGINEERS opened a bank, to be known as the Brotherhood National Bank of San Francisco, in that city on December 18. The board of directors is composed of representative business, professional and railroad men.

EMPLOYEES OF THE ST. LOUIS-SAN FRANCISCO to the number of 643 have been retired and placed on the pension roll of that company since the inauguration of the company's pension plan 13 years ago. Of the total, 393 are alive and on the pension roll today, and these have to their credit an aggregate of 11,279 years of service, an average per man of 28 years and 10 months. The 393 pensioners have been paid a total of $724,687 over the 13-year period or an average of $1,844 per man.

THE CANADIAN PACIFIC has announced two free scholarships, covering one year's tuition in the Faculty of Arts and four years' tuition in architecture, chemical, civil, mechanical or electrical engineering at McGill University, subject to competitive examination, to apprentices and other employees enrolled on the permanent staff of the company and under 21 years of age, and to minor sons of employees.

Pennsylvania Railroad Heroes

The directors of the Pennsylvania, on December 22, awarded heroic service medals to eight employees in recognition of extraordinary acts of heroism and valor beyond the line of duty. The medals were presented by President W. W. Atterbury at the regular board meeting. The recipients were Isaac Kyler, Miss Edna B. Drake, R. W. Howard, N. T. Leathers, Ira Puterbaugh, Daniel G. VanDemark, Thomas McIntyre and Foster D. Rose.

Trainmen of the Southeast Asking Increases

Officers of the railroads in the southeastern states, in conference with President L. E. Sheppard of the Order of Railway Conductors and vice-president W. N. Doak of the Brotherhood of Railroad Trainmen, have been discussing in Washington, in the last two weeks a request of these brotherhoods for an increase of wages, the proposal being that an advance should be made equal to that recently granted in eastern territory—7½ per cent. At last accounts, the roads and the representatives of the employees had agreed to take the question to the Board of Mediation, and conferences were held with members of the Board.

B. & M. to Extend Highway Service

The Boston & Maine Transportation Company, the highway subsidiary of the Boston & Maine, has filed with the Department of Public Utilities of Massachusetts a petition for authority to establish a motor coach service between Fitchburg, Mass., and Cambridge. The Fitchburg terminal will be the railroad station, connecting with the Fitchburg to Ashburnham motor coach line recently inaugurated by the Boston & Maine. The Cambridge terminal will be at Kendall Square, providing a convenient connection with the Boston rapid transit system.

The Boston & Maine Transportation Company goes to the Department of Public Utilities with licenses from every city and town through which the proposed route passes, it is stated in the petition.

It is proposed to operate a service on approximately a two-hour basis with motor coaches of modern parlor car type. Some of the runs will be operated in through service between Cambridge and Ashburnham, and return. Some trips will include Lexington Center, in order to meet a request from that town, while on others the motor coaches will go by way of the Mohawk Trail route.

Disastrous Collision at Rockmart, Georgia

In a collision on the Southern Railway at Rockmart, Ga., on the evening of December 23, about 6:20, northbound express train No. 2, the "Ponce de Leon," Florida express train, moving at good speed collided with the southbound "Royal Palm" express train, No. 101, Chicago to Miami, wrecking the northbound train and doing some damage to the southbound, which was at a standstill. Nineteen persons were killed or died within a few hours and over 30 were injured.

The killed were mostly passengers in the dining car of the northbound train which, though a steel car, was partly crushed by the daycoach next ahead of it. Among the killed were the fireman of the northbound train and road foreman of engines R. M. Pearce, on the same train, who was running the locomotive; the baggageman and four dining car employees.

The Royal Palm was on the main track just clear of the switch at which the northbound train should have entered the side track, and disregard of a dispatcher's order to enter the side track, on the part of the engineman of the northbound train, is given as the immediate cause.

On the New Haven at Readville, Mass.

Traffic

The St. Louis-San Francisco made a record during 1926 in the establishing of additional industries when tracks were laid for 430 new industries of all kinds.

The city passenger office of the Baltimore & Ohio in New York City has been moved from 1270 Broadway to 15 West 33rd street (Waldorf-Astoria Hotel).

The Chicago, Springfield & St. Louis, formerly the Chicago, Peoria & St. Louis, on December 22 resumed passenger train operation between Springfield and Alton.

The Northern Pacific, the Union Pacific and the Great Northern, in conjunction with the University of Idaho and Washington State College, are contemplating the operation of a demonstration train over the lines of these companies in northern Idaho and eastern Washington. The train will carry exhibits and agricultural specialists who will talk to farmers and demonstrate livestock and poultry results; and also will discuss crops and general farm activities of the area.

The New Orleans Traffic Club has elected officers for 1927 as follows: President, S. R. Barnett, manager of the Southern Cotton Oil Company; first vice-president, E. A. Groves, general agent of the Chicago, Rock Island & Pacific; second vice-president, V. Shaffenburg, traffic manager of the Myles Salt Company; third vice-president, A. J. Chapman, foreign freight agent of the Illinois Central; secretary, W. C. Young, city freight agent of the Illinois Central; and treasurer, B. M. Johnston, assistant traffic manager of the Fruit Dispatch Company.

Thomas Cook & Son to Represent P. R. R.

The Pennsylvania announces that Thomas Cook & Son, tour managers, have been appointed general foreign passenger agents to represent that road in their offices throughout the world. Thomas Cook & Son have 160 offices with about 5000 employees, their well-known tourist business having been begun in England in 1841. The Pennsylvania will, by this arrangement be represented in Europe, Australia, New Zealand, Tasmania, India, Burma, Ceylon, the Straits Settlements, Palestine, Syria, Mesopotamia, Egypt, the Sudan, Algeria, Tunisia, China, Japan, South Africa and the Belgian Congo.

Pacific Coast Transportation Advisory Board Meeting

According to reports submitted at the annual meeting of the Pacific Coast Transportation Advisory Board meeting at San Francisco, Cal., on December 17, for the first 11 months of the year, the total revenue freight loaded in the district showed an increase of 4 per cent compared with the same period in 1925, and an increase of 18 per cent over 1924. This volume of business is the greatest in the history of the state and was handled adequately and satisfactorily by the various transportation companies. The present officers of the board were re-elected. The next meeting will be held at Phoenix, Ariz., in March, 1927.

Cases Before Canadian Railway Board

Following three weeks' sittings, most of which were occupied with hearing evidence from British Columbia and with the examination of only two witnesses the hearing in Ottawa by the Dominion Railway Board of the general freight rates equalization case, arising out of instructions to the Board by the Federal Government, has been adjourned until January 11. The Board at the opening of the hearing decided to take the cases of the various provinces in order from West to East, so that Alberta will be the next to be heard.

From present prospects it appears that this case will occupy the Board for two months in the new year, while there are many other pressing questions to be dealt with by that body. There is the instruction of the Government to deal with the question of getting lower rates for the transportation of domestic coal from Alberta and the Maritime provinces to Ontario and Quebec, respectively; another instruction to encourage movement of freight through Canadian Atlantic ports along with the question of a lowering of grain rates on the National Transcontinental between Winnipeg and Quebec City to make use of the elevator and storage facilities at the latter port.

In addition to the application of the Maritimes and the Quebec Harbor Commission for such rates to Quebec City a resolution will be moved in the House of Commons at Ottawa when the session resumes in February by Milton Campbell, a Saskatchewan Progressive, providing for practically the same rate change.

Construction

ANN ARBOR.—The Toledo, Ohio, City Council has ordered this company, the Pennsylvania and the Toledo Terminal, to submit plans for the abolition of grade crossings at Summit street, Toledo.

CANADIAN PACIFIC.—A program of six branch lines in Saskatchewan and Alberta has been announced by the Canadian Pacific R. and legislation approving of their construction will be asked of Parliament at the present session. The lines will aggregate over 200 miles.

GREAT NORTHERN.—This company contemplates the renewal of a bridge at New Westminster, B. C., at a cost of about $51,000.

KANSAS CITY, MEXICO & ORIENT.—Plans have been prepared for the construction of a roundhouse and machine shop at McCamey, Tex.

LOUISVILLE & NASHVILLE.—A contract has been awarded to Rommell Brothers, Louisville, Ky., for the construction of a brick and concrete fireproof planing mill, 72 ft. by 120 ft., to cost about $75,000, at Paris, Tenn.

MISSOURI PACIFIC.—This company contemplates the construction of a water treating plant at Little Rock, Ark., to cost about $16,000.

Equipment and Supplies

THE MOBILE & OHIO is inquiring for five six-wheel switching locomotives. These locomotives are to have 21-in. by 28-in. cylinders.

THE PENNSYLVANIA has contracted with the Union Switch & Signal Company to furnish and install an electro-pneumatic interlocking at Richmond, Ind.; the machine to have 31 levers. This plant will include two distinct groups of switches and signals about 1,000 ft. apart, heretofore operated separately. The tower will be situated at one end of one of the groups. The signals are of the position-light type and the whole plant will have complete equipment of a.c. track circuits.

Iron & Steel

THE NORFOLK & WESTERN has ordered two 10-ton cranes and one 5-ton locomotive crane from the Whiting Corporation.

Machinery & Tools

THE LOUISVILLE & NASHVILLE has ordered 500 tons of structural steel from the Tennessee Coal, Iron & Railroad Company.

THE UNION PACIFIC has ordered 117 tons of structural steel for a 20-stall roundhouse at Ogden, Utah, from the Paxton & Vierling Iron Works.

On the P. R. R. Near Pittsburgh

Railway Officers

Samuel Porcher, general purchasing agent of the Pennsylvania, with headquarters at Philadelphia, Pa., has been

Samuel Porcher

promoted to assistant vice-president in charge of purchases, stores and insurance, effective January 1. Mr. Porcher was born on December 21, 1857, in South Carolina, and was graduated from the University of Virginia. He entered railway service in 1882, as an apprentice in the Altoona shops of the Pennsylvania. He remained in the mechanical department at Altoona, until 1888, when he bacame assistant engineer, motive power department, United Railroads of New Jersey division of the Pennsylvania at Jersey City, N. J. From 1894 to 1913 he was assistant purchasing agent and from 1913 until 1920, was purchasing agent of the Pennsylvania and subsidiaries. From January, 1918, until March 7, 1918, he was also attached to the office of the director, Division Finance and Purchase, United States Railroad Administration. On the latter date he was appointed a member of the Central Advisory Purchasing Committee, United States Railroad Administration. In March of the following year, he was appointed assistant director, Division of Purchases, and on March 1, 1920, was appointed general purchasing agent of the Pennsylvania Railroad system, which position he held until his recent promotion.

J. Humphrey Hustis, Jr., who has been appointed assistant to the vice-president of the New York Central Railroad, with headquarters at New York City, was born at Mount Vernon, N. Y., on February 13, 1893, and graduated from Harvard with the degree of A. B. in 1915. He entered railway service in September, 1915, with the Chicago & North Western, and after a year's service in their operating department, he entered the service of the New York Central Railroad as special agent of the superintendent's office at Buffalo, N. Y. In June, 1917, he was commissioned first lieutenant, Corps of Engineers. He returned from France in April, 1919, and shortly after returned to service with the New York Central as special agent on the staff of the Federal manager at New York. On March 16, 1920, he was appointed inspector of transportation. On July 1, 1922, he was appointed superintendent of property protection in charge of the newly formed property protection department which took over the direction of all railroad police and detective forces and the supervision of all freight loss and damage prevention activities, which position he was holding at the time of his recent appointment as assistant to the vice-president.

George M. Neville, vice-president and general manager of the Meridian & Bigbee River, with headquarters at Meridian, Miss., has been elected president, succeeding **S. A. Neville**, who will devote his time to the construction of the line between Meridian, Miss., and Myrtlewood, Ala.

Traffic

M. R. Garrison, chief of the tariff bureau of the New York Central line, Buffalo, N. Y., Clearfield, Pa., and East and the West Shore, with headquarters at New York City, has been appointed assistant general freight agent, with the same headquarters, succeeding **G. H. Clark**, promoted. **F. H. Owen** has been appointed chief of the tariff bureau, with headquarters at New York City, succeeding Mr. Garrison.

A. A. Gardiner, who has been attached to the office of the executive assistant to the traffic vice-president of the

A. A. Gardiner

Canadian National, has been appointed general passenger agent with jurisdiction in respect to trans-Atlantic and trans-Pacific passenger traffic. Mr. Gardiner became associated with the railway passenger service in June, 1907, when he joined the transportation department in Montreal as a clerk. In 1908 he went to the passenger department where he was made chief clerk in 1910, and 1920 became chief clerk in the office of the passenger traffic manager. In 1923 Mr. Gardiner was attached to the office of G. T. Bell, executive assistant to the traffic vice-president and continued in that position until his present appointment which became effective on November 1.

J. A. Flanders, Jr., general agent, freight department of the Delaware & Hudson, with headquarters at Chicago, Ill., has been appointed assistant general freight agent with headquarters at Albany, N. Y. **Charles H. Clark** has been appointed general agent, freight department, with headquarters at Chicago, succeeding Mr. Flanders. **H. W. Haas** has been appointed general agent, freight department, with headquarters at Pittsburgh, Pa., succeeding **S. Y. Baldwin**, retired. **James N. Vandenberge** has been appointed general agent, freight department, with headquarters at Buffalo, N. Y., succeeding Mr. Haas.

Mechanical

W. R. McMunn, who has been appointed superintendent of rolling stock of the Merchants Despatch, Inc., with

W. R. McMunn

headquarters at Rochester, N. Y., was born on July 19, 1876, at Williamsport, Pa., and was educated in the public schools of that place and in business college. He entered the service of the Pennsylvania in 1897, in their shops at Sunbury, Pa., remaining there until 1900. In February, 1901, he entered the service of the New York Central Railroad, rolling stock department, and served in various capacities in New York City and Albany until 1906, when he was appointed special inspector, acting in the capacity of assistant general car inspector, with headquarters at Albany. He remained in this position until 1912, when he was appointed chief clerk to the superintendent of rolling stock, with headquarters at New York. In 1914, he was appointed general car inspector, lines Buffalo and east, with headquarters at Albany, and in 1918, due to stress of the war, he was appointed assistant to the superintendent of rolling stock, with headquarters at New York. In 1921, when this position was abolished he returned to his former position as general car inspector, but with jurisdiction extended to the lines west of Buffalo, with headquarters at Buffalo.

This position he was holding at the time of his recent appointment as superintendent of rolling stock of the Merchants Despatch, Inc.

Engineering

C. A. Whipple, assistant engineer on the Hocking Valley, with headquarters at Columbus, Ohio, has been promoted to district engineer in charge of construction on the new Chesapeake & Hocking line between Gregg and Valley Crossing, Ohio. **C. E. Butler,** assistant engineer, has been promoted to resident engineer, section No. 1 of the new Chesapeake & Hocking line, with headquarters at Reese's Station, Ohio. **C. P. Essman,** assistant engineer, has been promoted to resident engineer, section No. 2, with headquarters at Ashville, Ohio. **E. E. Nelson,** assistant engineer, has been promoted to resident engineer, section No. 3, with headquarters at Circleville, Ohio. **J. S. Stevenson** of the Chesapeake & Ohio drafting force, has been promoted to resident engineer, section No. 4, with headquarters at Circleville, Ohio. **W. H. Eary,** assistant engineer of the Chesapeake & Ohio, with headquarters at Columbus, Ohio, has been promoted to resident engineer, section No. 5, with headquarters at Chillicothe, Ohio. **Enoch J. Jones,** instrumentman on the Hocking Valley, has been promoted to resident engineer, section No. 7, with headquarters at Chillicothe, Ohio.

Purchasing

C. E. Walsh, assistant purchasing agent of the Pennsylvania, with headquarters at Philadelphia, has been promoted to purchasing agent, with the same headquarters, succeeding **Montgomery Smith.** Mr. Walsh was born on

C. E. Walsh

September 20, 1882, at Uhrichsville, O., and entered railway service on May 6, 1899, as a storeroom clerk on the Pittsburgh, Cincinnati, Chicago & St. Louis (now a part of the Pennsylvania). After a number of advancements he became assistant purchasing agent in 1914. In 1920 he became assistant purchasing agent, Central region, with headquarters at Pittsburgh, and in 1924 was appointed assistant purchasing agent of the Pennsylvania Railroad system, which position he was holding at the time of his recent promotion.

Montgomery Smith, purchasing agent of the Pennsylvania, with headquarters at Philadelphia, has been promoted assistant to the general purchasing agent. **B. P. Phillippe,** assistant purchasing agent, at Philadelphia, has been promoted to fuel purchasing agent, with the same headquarters. **John Foley,** forester, has become assistant to the purchasing agent, and **H. R. Condon,** assistant forester, has become forester, succeeding Mr. Foley. **E. J. Lamneck,** stationary storekeeper, at Pittsburgh, has been promoted to assistant to the purchasing agent, with headquarters at Philadelphia. **C. B. Hall,** general storekeeper, at Philadelphia, has been promoted to stores manager, with the same headquarters, succeeding Mr. Young. **R. C. Harris,** assistant to stores manager, at Philadelphia, has been promoted to general storekeeper, with the same headquarters, and **W. R. F. Whaley,** assistant stationary storekeeper, at Pittsburgh, has succeeded Mr. Lamneck as stationary storekeeper, with the same headquarters.

C. D. Young, stores manager of the Pennsylvania, with headquarters at Philadelphia, has been promoted to general purchasing agent, with the same headquarters, effective January 1, succeeding **Samuel Porcher.** Mr. Young entered the service of the Pennsylvania as special apprentice in 1900, and between that year and 1910, held various motive power positions on the Pennsylvania, lines west of Pittsburgh. In 1911 he became engineer of tests in the Altoona shops, and in 1917 superintendent of motive power of the Philadelphia, Baltimore & Washington. Just before the armistice he was commissioned lieutenant-colonel of the engineers for service in France, returning to railroad duty later in the same year. In 1919 he became superintendent of the Schuylkill division of the Pennsylvania, and in 1920 general supervisor of stores.

C. D. Young

In January, 1924, he was promoted to stores manager, which position he was holding at the time of his recent promotion.

Obituary

Fred E. Sanborn, assistant to the president of the St. Johnsbury & Lake Champlain, the Montpelier & Wells River and the Barre & Chelsea, died on December 22, at St. Johnsbury, Vt. Mr. Sanborn was born in November, 1865, at Portsmouth, N. H., and was educated in the public schools of Portland. He entered the service of the Maine Central as a freight clerk in Portland in 1882. The following year he became passenger brakeman, advancing to baggage master in 1886, and to passenger conductor in 1892. In 1901 he became trainmaster on the Portland division and in 1903, assistant superintendent. He was advanced to superintendent of the Portland division in 1905, and to general superintendent in 1917. In 1918, he resigned and was assigned to the duties of claims investigator, retiring on pension on April 30, 1923.

Charles S. Lee, retired passenger traffic manager of the Lehigh Valley, died suddenly in New York, on December 21. Mr. Lee was born at Washington, D. C., and entered railway service in the seventies with the Cleveland, Cincinnati, Chicago & St. Louis. He was appointed chief clerk for the passenger department of the Denver & Rio Grande, and left that line in 1887 to become general passenger agent of the Colorado Midland, which line was built as a competing route to the Denver & Rio Grande. During his service with the Colorado Midland, he was latterly in charge of both the freight and passenger departments. On September 1, 1893, when the Colorado Midland became part of the Atchison, Topeka & Santa Fe, he became general passenger agent of the Lehigh Valley, with which company he remained until his retirement in 1915.

On the B. & M. at Woodsville, N. H.